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OF THE

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1869.

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⁂ A MAP of WESTERN TURKISTAN (by Arrowsmith), announced in the last volume of the Journal, is not yet ready.

Royal Geographical Society.

1869.

REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 24TH MAY.

THE Council have the pleasure of submitting to the Fellows the usual annual Report, relating to the financial condition and general state of the Society.

Members.—The total number of Fellows added to the list, since the last Anniversary, is 175—two of whom are Honorary Corresponding, and of the remainder 12 have paid Life Compositions. Last year the number was 190, and the year previous 147. The number lost to us by death is 41, and by resignation 24; if we add to these 23, which have been struck off the list for arrears of subscription, the total loss is 88, which is fewer by 23 than that of last year. The net increase in our numbers during the year is 87; in 1867-8 the increase was 79, and in 1866-7, 26.

Finances.—The balance-sheet for the financial year, given in Appendix A, compares favourably with its predecessor, which itself exhibited a large increase of receipts over previous years. The net amount of receipts will be seen to be 5991*l.* 4*s.*; in the previous year it was 5462*l.* 7*s.* 11*d.*; in 1866, 5085*l.* 8*s.* 3*d.*; in 1865, 4905*l.* 8*s.* 3*d.* There are, however, in the present balance-sheet two items of extraordinary receipts, and a more just idea of the progress of the Society may be obtained by comparing the total amount received as subscriptions, which in the past year was 4497*l.* 8*s.*, and in the previous year 4294*l.* 10*s.*

The expenditure during the year was 4156*l.* 17*s.* 10*d.*, showing an increase of 213*l.* 0*s.* 6*d.* over that of 1866, an increase which is more than accounted for by the sum expended in the promotion of Expeditions—namely, 558*l.* 16*s.* 6*d.*, as compared with 193*l.* 11*s.* 2*d.* in the previous year. The excess of income over expenditure is 1834*l.* 6*s.* 2*d.*, which, together with a portion of the balance in hand at the commencement of the year, has been added to the funded property of the Society. The total amount of the funded capital at the present time is 17,250*l.*; namely, in New 3 per Cents. 12,250*l.*, in India 5 per Cents. 4000*l.*, and in India Debentures 1000*l.*

The suit in Chancery in which the Society has had to appear, as mentioned in the last three Reports, in consequence of the legacy of 4000*l.* bequeathed by the late Benjamin Oliveira, Esq., is at length terminated; but the proportion due to the Society, out of the remainder of the estate, has not yet been received, and is not entered in the estimate for the year in the annexed balance-sheet (Appendix B). The decision of the Vice-Chancellor in this suit was to the effect that the Society, in common with the Royal Society (also a legatee) and other similar institutions were, in a legal point of view, charities; and, as such, could receive only bequests of personal estate. An appeal against this judgment was entered by the Royal Society and our own Body, in conjunction, but without success; the only alteration being a reversal of a portion of the previous decree, by which the expenses of the suit would be charged to the estate instead of to the legatees.

The accounts of the Society, as in former years, have been under the supervision of the Finance Committee of Council, which have held a meeting once a month.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec. 1868.

Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
1848	696	10	5	..	..		755	6	1
1849	778	3	0	..	..		1098	7	6
1850	1036	10	5	..	..		877	2	10
1851	1056	11	8	..	..		906	14	7
1852	1220	3	4	..	..		995	13	1
1853	1917	2	6	..	..		1675	6	0
1854	2565	7	8	..	..		2197	19	3
1855	2584	7	0	..	..		2636	3	1
1856	3372	5	1	533	10	0	2814	8	1
1857	3142	13	4	378	0	0	3480	19	9
1858	3089	15	1	..	..		2944	13	6
1859	3471	11	8	950	0	0	3423	3	9
1860	6449	12	1	466	17	6	5406	3	7
1861	4792	12	9	1358	2	6	3074	7	4
1862	4659	7	9	1389	7	6	3095	19	4
1863	5256	9	3	1837	10	0	3655	4	0
1864	4977	8	6	1796	5	0	3647	7	10
1865	4905	8	3	1041	5	0	4307	4	5
1866	5085	8	3	1028	15	0	4052	15	0
1867	5462	7	11	1029	0	6	3943	17	4
1868	5991	4	0	1857	3	9	4156	17	10

In 1856 a Treasury Grant of 1000*l.* for the East African Expedition received.

In 1860 a Treasury Grant of 2500*l.* for the East African Expedition received.

STATEMENT showing the Progress of the INVESTMENTS of the Society from the Year 1832 to the 31st Dec. 1868.

End of the Year, Dec. 31.	Cash invested.			Amount of Stock purchased.		
	£.	s.	d.	£.	s.	d.
1832	3657	10	0	4000	0	0
1833	4130	0	0	4500	0	0
1834	4426	0	0	4800	0	0
1835	4426	0	0	4800	0	0
1836	4426	0	0	4800	0	0
1837	4426	0	0	4800	0	0
1838	4426	0	0	4800	0	0
1839	4129	15	0	4500	0	0
1840	3788	10	0	4150	0	0
1841	2801	0	0	3150	0	0
1842	2801	0	0	3150	0	0
1843	2219	18	6	2578	4	4
1844	2219	18	6	2578	4	4
1845	2219	18	6	2578	4	4
1846	1933	1	0	2278	4	4
1847	2133	1	0	2502	6	2
1848	1886	16	8	2224	1	10
1849	1886	16	8	2224	1	10
1850	1886	16	8	2224	1	10
1851	1886	16	8	2224	1	10
1852	1886	16	8	2224	1	10
1853	1662	14	10	2000	0	0
1854	1662	14	10	2000	0	0
1855	1662	14	10	2000	0	0
1856	2216	4	10	2600	0	0
1857	2594	4	10	3000	0	0
1858	2594	4	10	3000	0	0
1859	3544	4	10	4000	0	0
1860	4011	2	4	4500	0	0
1861	5369	4	10	6000	0	0
1862	6758	12	4	7500	0	0
1863	8596	2	4	9500	0	0
1864	10365	7	4	11500	0	0
1865	11406	12	4	12500	0	0
1866	12435	7	4	13500	0	0
1867	13464	7	10	14500	0	0
1868	15321	11	7	16250	0	0*

The annual Audit was held at the end of March last, and was entrusted to the following gentlemen—General G. Balfour and Sir Charles Nicholson, Bart., selected from the Council, and Charles White, Esq., and F. Jones Williams, Esq., chosen from the body of the Fellows. The Council are sure that the

---

* Of which 3000*l.* is India 5 per Cents., and 1000*l.* India 5 per Cent. Debentures.

Society at large will authorise them to express their thanks, in this Report, to these able and experienced gentlemen for giving their valuable time so willingly to this arduous task.

Publications.—The 38th volume of the 'Journal' was published on the 3rd of May, and is now in course of distribution to Fellows, on their applying for their copies at the offices of the Society. The 12th volume of the 'Proceedings' has also been completed since the last Report, and two parts of Volume 13 published and sent out.

Library.—1216 volumes of books and scientific pamphlets have been added to the library during the year, 148 of which were by purchase, and the remainder by donation or exchange.

Among the more important works are—Prevost's 'Histoire des Voyages,' Ferguson's 'Serpent Worship' (presented by A. Davis, Esq., F.R.G.S.), A. Murray's 'Geographical Distribution of the Mammalia,' Marcoy's 'Voyage à travers l'Amérique du Sud,' and most of the recent books of travel.

The Library Committee have held numerous meetings during the year, and superintended the Librarian in the execution of his duties. A grant of 200*l.* having been voted by the Council for the purchase of geographical works, the Committee have been engaged in selecting such as were most required, but a portion only of the grant, namely 75*l.* 16*s.* 5*d.*, has yet been expended. 50*l.* have been spent in binding the books, chiefly the extensive series of Transactions of Societies, &c., which the Society now possesses. The Librarian is still engaged on the Classified Catalogue of the Library mentioned in last year's Report.

Map-Collection.—The accessions to the Map Department during the past year consisted of 3061 sheets of Maps and Charts, 12 Atlases, 9 Diagrams, and 33 Views. All have been mounted, catalogued, and incorporated into the classified collection.

The following are the most important:—

2596 Sheets of the Ordnance Survey of Great Britain and Ireland. Presented by the Topographical Office, through Sir Henry James, Director.

66 Sheets of Admiralty Charts. Presented by the Admiralty, through Capt. G. H. Richards, R.N., Hydrographer.

70 French Charts. Presented by the Dépôt de la Marine.

4 Sheets of the Geological Map of Sweden. Presented by the Geological Society of Sweden.

40 MS. Charts of South America. Purchased; from the library of the late Admiral Fitzroy.

50 Maps and Views. Presented by Consul T. J. Hutchinson.

12 Photographs of Scenery in Abyssinia. Presented by the Topographical Office.

2 Views of the Storming of Magdala. Presented by the War Office.

95 Sheets of the Land Revenue Survey of India. Presented by the India Office, through C. R. Markham, Esq., Secretary.

Pilot Chart of the Atlantic Ocean (5 sheets). Presented by the Hydrographic Office.

Atlases of Brazil, viz., one of the Empire of Brazil, one of River San Francisco, and one of River Velhas. Presented by the Brazilian Embassy.

Photograph of a Model of Victoria. Presented by C. D. Liger, Esq., Surveyor-General of Victoria.

Turkistan, on 4 sheets. By Col. J. T. Walker, Superintendent of the Topographical Survey of India. Presented by the India Office.

9 Photographs of Sinai. Presented by Rev. F. W. Holland.

5 Sheets of Abyssinia, showing the March of the British Army from Annesley Bay to Magdala. Presented by the Topographical Office.

3 Atlases and 25 Maps. Presented by Sir R. I. Murchison, President.

Atlas of Peru, by M. T. Paz-Soldan. Presented by the Author.

A Bust of R. Lander, Esq., Gold Medalist, has been placed in the Map-Room. Presented by Mrs. Elsom.

Grants to Travellers.—In the estimate for the year there appeared under this head two awards, one of 100*l.* to Mr. E. D. Young, and another of 50*l.* to Mr. Reid, of the Livingstone Search Expedition, given in consideration of the ability and success with which they carried out their mission. Besides these sums, 300*l.*, and 14*l.* 8*s.* 6*d.* for instruments, have been granted to Mr. G. S. W. Hayward in aid of his journey to Eastern Turkistan, and 50*l.* towards the Ordnance Survey of portions of the Sinai Peninsula, which was undertaken during the last winter by Captains Wilson and Palmer, under the direction of Sir Henry James. The difference between the total of these sums and 558*l.* 16*s.* 6*d.*, the expenditure for expeditions, is 44*l.* 8*s.*, the balance of Mr. Reid's salary, which was refunded by the Admiralty, as shown on the Debit side of the Balance-sheet.

APPENDIX A.

BALANCE-SHEET FOR THE YEAR 1868.

Receipts.

1868.	£.	s.	d.	£.	s.	d.
Balance in Banker's hands 31st Dec., 1867	584	10	9			
Ditto Accountant's Ditto	8	2	5	592	13	2
Subscriptions	2779	8	0			
Entrance Fees	591	0	0			
Life Compositions	811	0	0			
Arrears of Subscription	316	0	0	4497	8	0
Parliamentary Grant	..	..		500	0	0
Royal Premium	..	..		52	10	0
Sale of Publications	..	..		118	3	1
Advertisements	..	..		13	0	0
Sale of Stables belonging to the Society's house (15, Whitehall Place) to the Waterloo and Whitehall Railway Company	..	..		168	7	3
Refund by the Admiralty on account of the Salary of Mr. John Reid, employed on the Livingstone Search Expedition	..	..		122	15	4
Half Year's Dividend on 2000*l.* India 5 per Cents.	48	15	0			
Half Year's Dividend on 1000*l.* ditto Debentures	24	7	6			
Half Year's Dividend on 1,500*l.* New 3 per Cents.	168	3	9			
Half Year's Dividend on 3000*l.* India 5 per Cents.	73	2	6			
Half Year's Dividend on 1000*l.* India Debentures	24	7	6			
Half Year's Dividend on 12,250*l.* New 3 per Cents.	179	3	2	517	19	5
Miscellaneous	..	..		1	0	11
				£6583	17	2

Expenditure.

1868.	£.	s.	d.	£.	s.	d.
Rent, Taxes, and House Expenses	..	..		492	11	2
Salaries and Wages	..	..		1327	9	8
Library and Map-Rooms	..	..		195	12	5
Subscriptions, &c., returned	..	..		50	0	0
Gold Medals, and other awards ..	..	..		77	10	0
Postages, &c.	..	..		105	12	9
Office Expenses	..	..		279	16	8
Publications and Illustrations ..	..	..		957	12	1
Furniture and Repairs	..	..		57	12	5
Expeditions	..	..		558	16	6
Miscellaneous	..	..		54	4	2
				4156	17	10
Addition to Funded Property (1000*l.* India 5 per Cents.; 750*l.* New 3 per Cents.	..	..		1857	3	9
Balance in Banker's hands	566	19	9			
Ditto Accountant's ,, ...	2	15	10	569	15	7
				£6583	17	2

REGINALD T. COCKS, *Treasurer*, R.G.S.

Audited 31st March, 1869.

CHARLES NICHOLSON,
G. BALFOUR,
CHARLES WHITE,
F. JONES WILLIAMS, } *Auditors.*

APPENDIX B.

ESTIMATE FOR THE YEAR 1869.

Receipts.	£.	s.	d.	*Expenditure.*	£.	s.	d.
Cash Balance, 1st Jan., 1869	569	15	7	Rent, Taxes, and House Expenses	550	0	0
Annual Subscriptions	2750	0	0	Salaries and Wages	1350	0	0
Life Compositions	500	0	0	Library and Map-Rooms	350	0	0
Entrance Fees	450	0	0	Gold Medals and other Awards	80	0	0
Arrears of Subscriptions	150	0	0	Postages, &c.	130	0	0
Royal Premium for 1869	52	10	0	Office Expenses	300	0	0
Parliamentary Grant	500	0	0	Journal, with Maps, and Proceedings	1100	0	0
Sale of Publications, Advertisements, &c.	120	0	0	Library Catalogue (classified)	600	0	0
Dividends and Small Receipts	550	0	0		4460	0	0
				Amount available for investment or advancement of Geographical Science	700	0	0
				Cash Balance	482	5	7
	£5642	5	7		£5642	5	7

Library Regulations.

I. The Library will be open every day in the week (Sundays excepted) from 10·30 in the morning to 4·30 in the afternoon,* except on New-Year's Day, Good Friday to Easter Monday inclusive, and Christmas week; and it will be closed one month in the year, in order to be thoroughly cleaned, viz. from the first to the last day of September.

II. Every Fellow of the Society is entitled (*subject to the Rules*) to borrow as many as four volumes at one time.

Exceptions :—

1. Dictionaries, Encyclopædias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints, and unbound Numbers of Periodical Works, *unless with the special written order of the President.*
2. Maps or Charts, *unless by special sanction of the President and Council.*
3. New Works before the expiration of a month after reception.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the Library-register, with the borrower's signature, or accompanied by a separate note in his hand.

IV. No work of any kind can be retained longer than one month: but at the expiration of that period, or sooner, the same must be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application shall have been made in the mean time by any other Fellow.

V. In all cases a list of the Books, &c., or other property of the Society, in the possession of any Fellow, shall be sent in to the Secretary *on or before the* 1*st of July in each year.*

VI. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same.

VII. No stranger can be admitted to the Library except by the introduction of a Fellow, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

VIII. Fellows transgressing any of the above Regulations will be reported by the Secretary to the Council, who will take such steps as the case may require.

By Order of the Council.

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* On Saturday the Library is closed at 2·30 P.M.

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Vice-Patron.

H.R.H. THE PRINCE OF WALES.

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(ELECTED 24TH MAY, 1869.)

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Assistant Secretary and Editor of Transactions,

H. W. BATES, Esq.

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11th January, 1870.

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His Imperial Highness the Ex-Grand Duke of Tuscany.

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HONORARY CORRESPONDING.

Abich, Dr. William Hermann, St. Petersburg

Akrell, Gen. Carl, Topo. Corps of Sweden, Stockholm

Almeida, Dr. Candido Mendes de

Baer, Chev. de K. E., Mem. Imp. Acad. of Science .. .. .. St. Petersburg

Balbi, M. Eugène de .. .. .. Milan

Bastian, Dr. Adolph .. .. .. Bremen

Berghaus, Prof. Heinrich .. .. Berlin

Burmeister, Dr. Hermann, Buenos Ayres

Chaix, Prof. Paul .. .. .. Geneva

Coello, Don Francisco .. .. Madrid

Dana, Professor James D., New Haven, Connecticut

D'Avezac, M... .. .. Paris

Dufour, Gen., Director of the Topo. Depart., Switzerland .. .. .. Geneva

Duveyrier, M. Henri .. .. Paris

Ehrenberg, C. P., For. M.R. and L.S., Berlin

Erman, Prof. Adolph .. .. .. Berlin

Faidherbe, Général L., Général Commandant à Bone .. .. Algérie

Figanière, Command. Jorgé César, Lisbon

Forchhammer, Prof. P. W... .. Kiel

Fremont, General .. .. .. New York

Grinnell, Henry, Esq. V.P. Geogr. Soc. of.. .. .. New York

Guyot, Prof., LL.D., Princeton, New Jersey

Haidinger, Dr. William, V.P. Imp. Geogr. Soc. of .. .. Vienna

Hansteen, Prof., For. M.R.S. Christiania

Hazelius, M.-Gen. J. A., Chief of the Topo. Corps of Sweden .. Stockholm

Helmersen, Col. P. .. St. Petersburg

Hochstetter, Dr. Ferdinand von, Pres. Imp. Geograph. Soc. of .. .. Vienna

Hügel, Baron Ch. von .. .. Brussels

Irminger, Rear-Admiral C. L. C., R.D.N. Copenhagen

Jansen, Capt. M. H., D.R.N., Delft, Holland

Jochmus, Field Marshal Lieutenant Baron Vienna

Kennelly, D. J. Esq., F.R.A.S.

Khanikof, M. .. .. Paris

Kiepert, Dr. H. .. .. Berlin

Leal, His Exc. Senhor Fernando da Costa, Governor of Mozambique

Leal, José da Silva Mendes, Minister of the Colonies .. .. Lisbon

Linant Pasha .. .. .. Alexandria

Livingstone, David, Esq., M.D., LL.D.

Lütke, Admiral F. B., Pres. of the Imp. Academy of Sciences .. St. Petersburg

Macedo, J. J. da Costa de .. .. Lisbon

Madoz, Don Pascual .. .. .. Madrid

Malte-Brun, M. V. A., Hon. Sec. Geogr. Soc. of.. .. .. Paris

Maury, Commodore M. F.

Munzinger, Werner, Esq.

Nardi, Monsignor Francesco .. Rome

Negri, Chevalier Cristoforo .. .. Turin

Petermann, Dr. Augustus .. .. Gotha

PHILIPPI, Dr. Rodulfo Armando .. Chili
PLATEN, His Excellency Count.
RAIMONDY, Don Antonio .. .. .. Lima
RANUZZI, Count Annibale .. .. Bologna
RÜPPELL, Dr. E., For. M.L.S. .. Frankfort

SALAS, Don Saturnino, Pres. Topo. Depart., Argentine Repub. .. .. Buenos Ayres
SCHEDA, Herr von, Director of the Imp. Inst. of Military Geogr. .. .. Vienna
SCHERZER, Dr. Karl von .. .. Vienna
SOLDAN, Don Marino Felipe Paz Lima.
SONKLAR, Lieut.-Col. the Chev. de, Wiener Neustadt, Vienna
STRUVE, Prof. Otto, Imp. Observ. of Pulkowa .. .. .. St. Petersburg
SYDOW, Lt.-Col., Emil von (Chief of the Geographical Department of the Staff of the Prussian Army), Behrenstrasse, 66, Berlin

TCHIHATCHEF, M. Pierre de .. Paris
TSCHUDI, Herr T. T. von .. .. Vienna
VANDER MAELEN, Mr. Ph. .. Brussels
VASCONCELLOS É SILVA, Dr. Alfredo Casimiro de .. .. .. Rio de Janeiro
VERNEUIL, M. E. de .. .. .. Paris
VILLAVICENCIO, Don Manuel Guayaquil
WRANGELL, Adm. Baron .. St. Petersburg
ZIEGLER, M. J. M. .. .. Winterthur

FELLOWS.

(To 11th January, 1870.)

N.B.—*Those having * preceding their names have compounded for life.*

Year of Election.	
1869	Abbott, Keith E., H.M. Consul. *Odessa.*
1868	*Abbott, Wm., S. D., Esq. 28, *Pembridge-crescent, W.*
1863	Abdy, Rev. Albert, M.A. *Linslade-vicarage, Leighton Buzzard.*
1860	À Beckett, Arthur M., Esq., F.R.C.S.E.
1851	Abinger, W. F. Scarlett, Lord. *Guard's Club, S.W.*
1865	Abercromby, Hon. J. *4th Battalion Rifle Brigade, Chester.*
1865	Acheson, Frederick, Esq., C.E. 7, *College-hill, Highbury-park, North, N.*
1861	Acland, J. Barton Arundel, Esq. *Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq.*, 34, *Hyde-park-gardens, W.*
1853	Acland, Sir Peregrine Palmer F. P., Bart. *Fairfield, Somerset.*
1830	10 *Acland, Sir Thomas Dyke, Bart., F.R.S. 34, *Hyde-park-gardens, W.; and Killerton, Exeter, Devon.*
1837	Adair, Col. Alex. Shafto. 7, *Audley-square, W.*
1867	Adare, Viscount. *Clearwell-court, Coleford, Gloucestershire.*
1861	Addington, Right Hon. H. U. 78, *Eaton-place, S.W.*
1862	Addison, Col. Thomas, C.B.
1859	Ainslie, Col. H. Francis. *Burlington-chambers*, 180, *Piccadilly, W.; and United Service Club, S.W.*
1830	*Ainsworth, W. F., Esq., F.S.A. *Ravenscourt-villa, New-road, Hammersmith, W.*
1859	Airlie, David Graham, Earl of. *Holly-lodge, Kensington, W.*
1860	Aitchison, David, Esq. 180, *Piccadilly, W.*
1830	*Albemarle, George Thomas, Earl of. 11, *Grosvenor-square, W.; Quiddenham-hall, Larlingford, Norfolk; and Elvedon-hall, Suffolk.*
1862	20 Alcock, Sir Rutherford, K.C.B. *Athenæum Club, S.W.*
1838	*Aldam, William, Esq. *Frickley-hall, near Doncaster.*
1865	Aldom, Joseph R. Esq., M.A., PH. DR. *Salway-house, Leyton, Essex.*
1857	Aldrich, Captain Robert D., R.N. *Windmill-road, Croydon, Surrey, S.*
1830	Alexander, Colonel Sir Jas. Ed., K.C.L.S., F.R.A.S., F.R.S.E., etc., 14th Regt. *United Service Club, S.W.; and Westerton-house, Bridge of Allan, N.B.*
1864	Allan, C. H., Esq. *Lloyd's, E.C.; and* 31, *Park-street, Stoke Newington, N.*
1857	Allan, G. W., Esq. *Moss Park, Toronto, Canada. Care of Gen. J. H. Lefroy,* R.A., 28, *Queen's-gate, W.*

Year of Election.	
1858	Allan, Jas., Esq. 122, *Leadenhall-street, E.C.*
1867	Allen, Alderman Wm. F. 6, *Petersham-terrace, South Kensington, W.*
1865	Allen, James Pearce, Esq. 13, *Waterloo-place, S.W.*
1854	30 Ancona, J. S., Esq. 8, *John-street, Adelphi, W.C.*
1860	Anderdon, John Edmund, Esq. *Henlade-house, Taunton, Somerset.*
1867	Anderson, Sir Henry L., K.C.B. *India-office, S.W.*
1862	Anderson, James, Esq. 1, *Billiter-court, City, E.C.*
1861	Anderson, John, Esq. Messrs. W. R. Adamson and Co. *Shanghai. Care of Messrs. Jno. Burd and Co., Hong Kong. Per Messrs. Adam, Thomson, and Co.*, 48, *Lime-street, E.C.*
1868	Anderson, John, Esq. *Conservative Club, S.W.*
1868	Anderson, Joseph, Esq. 7, *Cleveland-square, Hyde-park, W.*
1856	*Andrew, William P., Esq.
1867	Andrews, G. H., Esq. *The Cedars, New Brentford.*
1866	Andrews, John R., Esq. *East-hill-house, Wimbledon, S.W.*
1868	40 Angas, George F., Esq. 72, *Portland-road, Notting-hill, W.*
1861	Annesley, Col. the Hon. Hugh, M.P. 25, *Norfolk-street, Park-lane, W.*
1860	*Anson, Sir John William Hamilton, Bart. 55, *Portland-place, S.W.; and Sherley-house, Croydon.*
1853	Ansted, Prof. D. T., M.A., F.R.S., etc. 33, *Brunswick-square, W.C.; Athenæum Club, S.W.; and Chateau Vieux, St. Léonard, Boulogne-sur-Mer.*
1868	*Anstey, Chisholm, Esq. *Bombay. Care of Messrs. King and Co.*
1857	Anstruther, M.-Gen. Philip, C.B., Madras Artil. *Airth-castle, by Falkirk, N.B.*
1864	Anstruther, Lieut. R. L., Rifle Brigade. *Staff-college, Farnboro'-station, Hants.*
1830	*Antrobus, Sir Edmund, Bart. 146, *Piccadilly, W.; Lower Cheam, Epsom, Surrey; and Amesbury, Wilts.*
1863	Arber, Edward, Esq., A.K.C. *Admiralty, W.C.; and* 5, *Queen's-square, Bloomsbury, W.C.*
1858	Arbuthnot, George, Esq. 23, *Hyde-park-gardens, W.*
1862	50 Arbuthnot, Major George, R.H.A. *Cowarth, Sunningdale.*
1861	Archer, Graves Thos., Esq. 1, *Ennismore-place, Prince's-gate, S.W.*
1866	Arconati, The Marquis Giarmmartino. *Casa Prini, Pisa. Care of Mr. Bernard Quaritch*, 15, *Piccadilly, W.*
1855	*Arden, Richard Edward, Esq. *Sunbury-park, Middlesex, S.W.*
1858	*Armistead, Rev. Charles John, M.A., F.S.A. *United University Club, S.W.; and National Club, S.W.*
1863	Armitage, Edward, Esq. 3, *Hall-road, St. John's-wood, N.W.*
1867	Armitstead, Geo., Esq., M.P. *Errol-park, Errol, N.B.*
1857	Armstrong, Alexander, Esq., M.D., R.N., F.R.C.P., Director-General of the Navy Medical Department. *Admiralty, Somerset-house, W.C.; and Junior United Service Club, S.W.*
1830	*Arrowsmith, John, Esq., F.R.A.S. 35, *Hereford-square, Old Brompton, S.W.*
1863	Arthur, Captain William, R.N. *The Priory, Leatherhead.*
1869	60 Ashbee, Edmund Wm., Esq., F.G.S. 17, *Mornington-crescent, Regent's-park, N.W.*
1863	Ashburton, Alex. Hugh, Lord.

Year of Election.	
1864	*Ashton, R. J. Esq. _Hatton-court, Threadneedle-street, E.C._
1853	*Ashwell, James, Esq., M.A., F.G.S.
1830	*Atkins, John Pelly, Esq., F.S.A. _Halsted-place, near Sevenoaks._
1869	Atlee, Charles, Esq. _The Park, Ealing, W._
1860	Attwell, Professor Henry. _Barnes, S.W._
1869	Auld, Thomas Reid, Esq. 36, _Portland-place, W._
1859	Austen, Capt. Henry H. Godwin, 24th Foot, Trig. Survey, Panjab. _Junior United Service Club, S.W.; and Chilworth-manor, Guildford, Surrey._
1863	Austin, John G., Esq. _Care of the Colonial Company,_ 16, _Leadenhall-street, E.C._
1854	70 Ayrton, Acton S., Esq., M.P. 3, _Essex-court, Temple, E.C._
1846	*Ayrton, Frederick, Esq.
1866	*Babington, William, Esq., 23, _Fulham-place, Maida-hill, West, W.; and Bonny River, West Coast of Africa._
1836	*Back, Admiral Sir Geo., D.C.L., F.R.S. 109, _Gloucester-place, Portman-sq., W._
1866	Bacon, Geo. Washington, Esq. 127, _Strand, W.C._
1864	Badger, Rev. Geo. P. 21, _Leamington-road-villas, Westbourne-park, W._
1863	Bagot, Christopher N., Esq. _Oriental Club, W._
1862	Bagot, Capt. L. H. _Care of C. S. Bagot, Esq.,_ 40, _Chancery-lane, W.C._
1859	Bailey, L. C., Esq., Staff Commander, R.N. _Topographical Department, New-street, Spring-gardens, S.W._
1857	Baillie, Lt.-Colonel John, Bengal Staff Corps. 22, _Palace-gardens-terrace, Kensington, W._
1861	80 Baillie, William Henry, Esq. 2, _Gloucester-road, Hereford-square, S.W._
1857	Baines, Thomas, Esq. _Care of Mrs. Baines,_ 14, _Union-street, King's Lynn, Norfolk._
1861	*Baker, John, Esq.
1862	Baker, Capt. Robert B. _Oriental Club, Hanover-square, W._
1865	Baker, Sir Samuel White, Pasha. _Hedenham-hall, Bungay, Norfolk; and_ 118, _Belgrave-road, S.W._
1855	Baker, Major Wm. T., 85th Regt. _Junior United Service Club, S.W.; and_ 31, _Grosvenor-place, Bath._
1861	Baldwin, William Charles, Esq. _Leyland-vicarage, Preston._
1861	Balfour, David, Esq. _Balfour-castle, Kirkwall, N.B._
1847	Balfour, Maj.-General George, R.A., C.B. 6, _Cleveland-gardens, Hyde-park, W.; and Oriental Club, Hanover-square, W._
1853	Balfour, John, Esq. _New South Wales; and Colinton, Queensland;_ 39, _St. James's-street, S.W._
1863	90 Balfour, John Osborn, Esq. 7, _The Common, Woolwich._
1863	Balfour, William, Esq. 1, _Gladstone-villas, Walmer-road, Deal, Kent._
1860	Balinhard, the Right Hon. James Carnegie, Lord. _Kinnaird-castle, Brechin._
1860	Ball, John, Esq. _Oxford and Cambridge Club, S.W._
1863	Bamforth, Rev. J., Principal of Doveton College. _Madras._

Year of Election.		
1852		Bancroft, Capt. W. C., 16th Regt. *Aide de Camp and Military Sec., King's House, Jamaica; M'Gregor and Co., Charles-street, S.W.*
1862		Banks, George F., Esq., Surgeon R.N.
1858		Bannerman, Sir Alexander, Bart. 46, *Grosvenor-place, S.W.*
1868		Barber, Captain Harby, J. A. 55, *Parliament-street, S.W.*
1869		Barchard, Francis, Esq. *Horsted-place, Uckfield.*
1863	100	Barford, A. H., Esq., M.A. 1, *Cornwall-terrace, Regent's-park, N.W.*
1835		*Baring, John, Esq. *Oakwood, Chichester.*
1844		*Baring, Thomas, Esq., M.P. 41, *Upper Grosvenor-street, W.*
1862		Barlee, Frederick Palgrave, Esq. *Perth, Western Australia. Care of G. Laurence, Esq.*, 12, *Marlboro'-road, Lee, S.E.*
1868		Barlow, Frederick Thomas Pratt, Esq. 26, *Rutland-gate, S.W.*
1864		Barnett, H. C., Esq. *Care of Alex. Whytock, Esq.*, 9, *George-street, Edinburgh.*
1867		*Barns, John W., Esq. *Bhawulpore, Punjaub, India; and Higher Town, Buckfastleigh, Devon.*
1858		Barratt, James, Esq. *Lymne-hall, near Harrington, Cheshire.*
1859		Barrington, Lord, M.P. 19, *Hertford-street, Mayfair, W.*
1867		Barrington Ward, Marcus J., Esq., B.A., F.L.S., &c. *Clifton-cottage, Bristol; and* 14, *Alfred-street, Belfast.*
1833	110	Barrow, John, Esq., F.R.S., F.S.A. 17, *Hanover-terrace, Regent's-park, N.W.*
1863		Barry, Alfred, Esq.
1857		Bartholomew, John, Esq. 17, *Brown-square, Edinburgh.*
1861		Bartlett, Herbert Lewis, Esq. *Union Club, S.W.*
1862		Barton, Alfred, Esq., M.D. *Hampton Court.*
1864		Basevi, Capt. J. P., R.E. 100, *Belgrave-road, S.W.; Messrs. Grindlay & Co., Parliament-street, S.W.*
1837		*Bateman, James, Esq., F.R.S., L.S. *Knypersley-hall, Staffordshire.*
1859		Bateman, John F., Esq., C.E. 16, *Great George-street, Westminster, S.W.*
1866		Bates, Henry Walter, Esq., F.Z.S. 15, *Whitehall-place, S.W.*
1866		Bateson, George, Esq. *Heslington-hall, York.*
1866	120	Batten, John H., Esq. *Alverne-hill, Penzance; and Oriental Club, Hanover-square, W.*
1864		Bax, Capt. Henry G. 2, *Sussex-place, Hyde-park-gardens, W.*
1867		*Baxter, Sir David, Bart. *Dundee;* 5, *Moray-place, Edinburgh; and Kilmaron-castle, Cupar, Fife.*
1867		Baxter, Richard, Esq. (Barrister-at-Law). 19, *Leinster-gardens, Bayswater, W.*
1858		Baxendale, Joseph H., Esq. 78, *Brook-street, W.; and Scott's-bridge, near Rickmansworth, Herts.*
1867		Bayley, Chas. Jno., Esq., C.B., M.A. 51, *Victoria-road, Kensington, W.*
1863		Bayley, H. Esq. *Blackheath-park, Kent.*
1862		Bayly, Lieut.-Col. John, R.E. *Ordnance Survey Office;* 131, *St. George's-road, Pimlico, S.W.*
1862		Baynes, Lieut.-Col. R. Stuart. *Army and Navy Club, S.W.; and* 38, *Jermyn-street, S.W.*
1868		Baynton, Capt. Edward. *Trafalgar-lodge, Shirley, Southampton.*

Year of Election		
1866	130	Beamish, Captain H. H., R.N. *Care of Messrs. Hallett and Co., 7, St. Martin's-place, W.C.*
1852		Beardmore, Nathaniel, Esq., C.E. 30, *Great George-street, Westminster, S.W.*
1854		Beaufort, William Morris, Esq., Bengal Civil Service. *Bengal.*
1856		Beaumont, John Aug., Esq. *Wimbledon-park-house, Wimbledon, S.W.; and* 50, *Regent-street, W.*
1851		*Beaumont, Wentworth B., Esq., M.P. 144, *Piccadilly, W.; Bywell-hall, Newcastle-upon-Tyne; and Bretton-park, Wakefield.*
1867		Beazeley, Alexander, Esq., C.E. *Engineers' Office, Trinity-house, E.C.*
1867		*Beazeley, Michael, Esq., M.I.C.E. *Trinity Works, Penzance, Cornwall.*
1865		Bebb, Horatio, Esq. 13, *Gloucester-place, W.; and Leamington.*
1861		Beckett, James F., Esq., Staff Commander R.N., F.R.S.A. 6, *Boyne-terrace, Notting-hill, W. Care of Captain George.*
1838		Beckford, Francis L., Esq. *Ruxley-lodge, Esher, Surrey.*
1859	140	*Bedford, Rear-Admiral G. Augustus, R.N. *South-view, Widmore-road, Bromley, Kent.*
1868		Bedingfeld, Felix, Esq. *Reform Club, S.W.; and* 41, *Clarges-street, W.*
1861		*Begbie, James, Esq. 17, *Trinity-square, Tower-hill, E.C.*
1860		Begbie, Thomas Stirling, Esq. 4, *Mansion-house-place, E.C.*
1846		Beke, Charles Tilstone, Esq., PH. DR., F.S.A., &c. *Bekesbourne-house, near Canterbury.*
1853		Belcher, Rev. Brymer. *St. Gabriel's, Pimlico, S.W.*
1830		*Belcher, Vice-Adm. Sir Edward, K.C.B., F.R.A.S. 22A, *Connaught-square, W.*
1858		Beldam, Edw., Esq. *Royston, Herts.*
1863		Belmore, The Earl of. *Carlton Club, S.W.*
1858		*Bell, C. Davidson, Esq., Surveyor-General, Cape of Good Hope. *Cape Town. Care of the S. A. Pub. Library, Cape Town. Per Messrs. H. S. King and Co.*
1830	150	Bell, James Christian C., Esq. 42, *Westbourne-terrace, W.; and* 15, *Angel-court, Throgmorton-street, E.C.*
1868		Bell, Wm. A., Esq. B.A., M.D., 18, *Hertford-street, Mayfair, W.*
1864		Bellamy, Edward, Esq. 10, *Duke-street, St. James's, S.W.*
1830		*Bennett, John Joseph, Esq., F.R.S. *British Museum, W.C.*
1857		Bennett, J. Risdon, Esq., M.D. 15, *Finsbury-square, E.C.*
1856		*Benson, Robert, Esq. 16, *Craven-hill-gardens, Bayswater, W.*
1856		*Benson, William, Esq., Barrister-at-Law. 16, *Craven-hill-gardens, Bayswater, W.*
1830		Bentham, George, Esq., Pres. L.S. 25, *Wilton-place, S.W.*
1868		Bentley, George, Esq. *Upton-park, Slough.*
1833		Bentley, Richard, Esq. *New Burlington-street, W.*
1859	160	Berens, H. Hulse, Esq. *Sidcross, Foot's Cray, Kent.*
1865		Bernard, P. N., Esq. 16, *Leadenhall-street, E.C.*
1866		Berridge, F., Esq. *Winchester-house, Winchester-road, Adelaide-road, N.W.*
1856		Berry, Josiah, Esq. 16, *Regent-square, W.C.*
1863		Best, William, Esq. 3, *Belle-vue-place, Southampton.*
1867		Best, William John, Esq. 104, *Franklin-street, New York.*

Year of Election.		
1867		Bethune, Alexander M., Esq. *Otterburn, Hamlet-road, Upper Norwood; and* 122, *Leadenhall-street, E.C.*
1842		*Bethune, R.-Adm. C. R. Drinkwater, C.B. 4, *Cromwell-rd., South Kensington, W.*
1864		*Betts, E. L., Esq. *Preston-hall, Maidstone, Kent.*
1836		Betts, John, Esq. 115, *Strand, W.C.*
1868	170	Bevan, George Phillips, Esq. *Junior Athenæum Club; and* 4, *Suffolk-square, Cheltenham.*
1866		Bevan, William, Esq. 8, *Cedars-road, Clapham-common, S.*
1862		Bicker-Caarten, Peter, Esq. 30, *Northumberland-place, Bayswater, W.*
1866		Bicknell, Algernon S., Esq. 37, *Onslow-square, S.W.*
1869		Bidie, Geo., Esq., M.D., &c. Madras Establishment, Madras. *Care of Messrs. H. S. King and Co.*
1865		Bidwell, Charles Toll, Esq. *Garrick Club,* 35, *King-st., Covent Garden, W.C.; and* 28, *Grosvenor-st., Eaton-sq., S.W. Care of John Bidwell, Esq., Foreign-office.*
1860		Bidder, G. Parker, Esq., C.E. 24, *Gt. George-st., S.W.; and Mitcham, Surrey, S.*
1859		Bigge, Frederick W., Esq. *Debden-hall, Saffron Walden.*
1868		Biggs, C. H. Walker, Esq. 2, *Alexandra-terrace, Reading.*
1850		Bigsby, John J., Esq., M.D. 89, *Gloucester-place, Portman-square, W.*
1858	180	Birch, Augustus F., Esq., M.A.
1860		Birch, H. W., Esq. 46, *Welbeck-street, Cavendish-square, W.*
1858		Birch, John William, Esq. 9º, *New Broad-st., E.C.; and* 27, *Cavendish-sq., W.*
1859		Birch, Capt. Thomas, R.N. *United Service Club, S.W.*
1862		*Birchill, Capt. B. H. H. *Old-lodge, Hartfield, Tunbridge-wells.*
1867		*Bischoffsheim, Henri Louis, Esq. 7, *Grafton-street, New Bond-street, W.*
1858		Bishop, George, Esq., F.R.A.S. *Union Club, S.W.; and The Meadows, Twickenham, S.W.*
1861		Bishop, James, Esq. 11, *Portland-place, W.*
1867		Bisson, Fredk. S. de Carteret, Esq. (Lieut. R.I.M.). 70, *Berners-street, W.*
1836		*Blaauw, William H., Esq., M.A., F.S.A., F.Z.S. *Beechlands, near Uckfield, Sussex.*
1860	190	*Black, Francis, Esq. 6, *North-bridge, Edinburgh.*
1867		Black, Thomas, Esq., Superintendent P. and O. Steam Navigation Company's Dockyard. *Oriental-place, Southamptom.*
1869		Blacker, Louis, Esq. *Flowermead, Wimbledon-park, S.W.*
1858		Blackett, Henry, Esq. 13, *Great Marlborough-street, W.*
1849		Blackie, W. Graham, Esq., PH. DR. 36, *Frederick-street, Glasgow.*
1862		*Blackstone, Frederick Elliot, Esq., B.C.L. *British Museum, W.C.*
1854		Blaine, D. Roberton, Esq., Barrister-at-Law. 3, *Paper-buildings, Temple, E.C. and* 8, *Southwick-place, Hyde-park-square, W.*
1869		Blaine, Henry, Esq. 79, *Belsize-park-gardens, Hampstead.*
1868		Blair, William Edward, Esq. *Windham Club, S.W.*
1865		Blake, Brig.-Gen., H. W. *Maulmein, British Burmah.*
1857	200	*Blake, Wollaston, Esq. 8, *Devonshire-place, W.*
1868		Blakiston, Matthew, Esq. *Mobberley, Knutsford, Cheshire.*
1857		Blakiston, Captain Thomas, R.A. 28, *Wellington-street, Woolwich, S.E.*

Year of Election.		
1861		*Blakeney, William, Esq., R.N. *Hydrographic-office, S.W.*
1868		Blanc, Henry, Esq., M.D., &c. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall, S.W.*
1830		*Blanshard, Henry, Esq., F.R.A.S.
1861		*Blanshard, Henry, Esq. 78, *Westbourne-terrace, W.; and* 53, *Chancery-lane, W.C.*
1857		Blanshard, Richard, Esq. *Fairfield, Lymington, Hants.*
1865		Blaxall, Fras. H., Esq., M.D. *Tendring, near Colchester.*
1854		Blencowe, W Robert, Esq. *The Hook, Lewes.*
1861	210	Blenkin, William, Esq. *Addlestone, Surrey.*
1839		*Blewitt, Octavian, Esq. 4, *Adelphi-terrace, Strand, W.C.*
1864		Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, *Manchester-square, W.*
1866		Blow, William Wootton, Esq. 22, *Wigmore-street, W.*
1861		Bloxsome, Oswald, jun., Esq. *Wherstead-park, Ipswich, Suffolk.*
1868		Blumberg, George F., Esq. 4, *Ladbroke-square, Kensington-park, W.*
1837		*Blunt, Jos., Esq.
1863		*Blunt, Wilfred, Esq.
1868		Blyth, Philip P., Esq. (J.P. for Middlesex). 53, *Wimpole-street, W.*
1858		Bohn, Henry G., Esq. *York-street, Covent-garden, W.C.; and North-end-house, Twickenham, S.W.*
1850	220	Bollaert, William, Esq. 21A, *Hanover-square, W.*
1862		Bolton, Capt. Francis John, 12th Regt. *Chatham.*
1861		Bompas, George Cox, Esq. 15, *Stanley-gardens, Kensington-park, W.*
1864		Bone, John William, Esq., B.A., F.R.S.L., F.S.S. 26, *Bedford-place, Russell-square, W.C.*
1861		Bonney, Charles, Esq. *Adelaide, Australia.*
1858		Bonnor, George, Esq. 49, *Pall-mall, S.W.; and* 2, *Bayswater-terr., Kensington-square, W.*
1865		Bonwick, James, Esq. *St. Kilda, Melbourne. Care of W. Beddow, Esq.,* 22, *South Audley-street, W.*
1866		Booker, Wm. Lane, Esq. *Care of F. B. Alston, Esq., Foreign-office.*
1859		Borough, Sir Edward, Bart. 4, *Nassau-street, Dublin.*
1845		*Borrer, Dawson, Esq. *Altmont Ballon, Co. Carlow, Ireland.*
1856	230	*Botcherby, Blackett, Esq., M.A. 174, *Brompton-road, S.W.*
1858		*Botterill, John, Esq. *Flower-bank, Burley-road, Leeds.*
1860		Boustead, John, Esq. 34, *Craven-street, Strand, W.C.*
1866		*Boutcher, Emanuel, Esq. 2, *Oxford-square, Hyde-park, W.*
1865		Bouverie, P. P., Esq. 32, *Hill-street, Berkeley-square, W.*
1855		Bovet, Charles, Esq. 135, *Camden-road, N.W.*
1867		Bowell, Wm., Esq. *Chandos-house, Hereford; and Gate-house Grammar-school, Hereford.*
1861		*Bowen, Charles Christopher, Esq. *Christchurch, Canterbury, New Zealand. Care of A. O. Ottywell, Esq.,* 16, *Charing-cross, S.W.*
1854		*Bowen, Sir George Ferguson, K.C.M.G., M.A. *Governor of New Zealand.*
1866		Bower, Anthony Maw, Esq.

Year of Election.		
1862	240	Bowie, John, Esq. *Conservative Club, S.W.*
1869		Bowker, James Henry, Esq. *Basutuland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.*
1868		Bowly, William, Esq. *Cirencester.*
1856		Bowman, John, Esq. 9, *King William-street, E.C.*
1869		Bowra, E. C., Esq., Commissioner of Maritime Customs. *Ningpo, China.*
1865		Bowring, John Charles, Esq. *Larkbeore, Exeter.*
1866		Bowring, Samuel, Esq. 1, *Westbourne-park, W.*
1868		Bowser, Alfred T., Esq. *Cromwell-house, Hackney, N.E.*
1862		Boyce, Rev. W. B., Secretary to Wesleyan Missionary Society. *Wesleyan Mission House, Bishopsgate-street, E.C.*
1845		*Boyd, Edward Lennox, Esq., F.S.A. 35, *Cleveland-square, Hyde-park, W.*
1865	250	Boyle, Frederick, Esq. *The Firs, Bebington, Cheshire.*
1869		Boyle, Richard Vicars, Esq., M.I.C.E., &c. 9, *Stanhope-place, Hyde-park, W.*
1856		Boyne, G. Hamilton-Russell, Viscount. 22, *Belgrave-square, S.W.; Brancepeth-castle, Durham; and Burwarton-hall, Ludlow, Salop.*
1851		Bracebridge, Charles Holte, Esq. *Atherstone, Warwick.*
1862		Braithwaite, Isaac, Esq. 68, *Old Broad-street, E.C.*
1863		*Bramley-Moore, John, Esq. *Langley-lodge, Gerrard's-cross, Bucks.*
1859		*Brand, James, Esq. 109, *Fenchurch-street, E.C.*
1868		Brand, Jas. Ainsworth, Esq. 42, *Mornington-road, Regent's-park, N.W.*
1867		Brandis, Dr. D., F.L.S. *Director of Forests, Calcutta. Care cf W. H. Allen, Esq., 13, Waterloo-place, S.W.*
1860		Brassey, T., Esq. 4, *Great George-street, S.W.; and 56, Lowndes-square, S.W.*
1859	260	Braybrooke, Philip Watson. *Assistant Colonial Secretary, Ceylon. Messrs. Price and Co., Craven-street.*
1861		*Brenchley, Julius, Esq. *Oxford and Cambridge Club, S.W.; and Milgate, near Maidstone, Kent.*
1846		Brereton, Rev. C. D., M.A. *Little Massingham, Rougham, Norfolk.*
1833		*Brereton, Rev. John, LL.D., F.S.A. *Bedford.*
1834		*Breton, Wm. Henry, Esq., Commd. R.N., M.R.I. 15, *Camden-crescent, Bath.*
1862		Brett, Charles, Esq.
1867		Bridge, John, Esq. *Altrincham, Cheshire.*
1858		Bridges, Nathaniel, Esq.
1852		*Brierly, Oswald W., Esq. 8, *Lidlington-pl., Harrington-sq., Hampstead-rd., N.W.*
1865		Briggs, Major, J. P.
1861	270	*Bright, Sir Charles T., F.R.A.S. 6, *Westminster-chambers, Victoria-street, S.W; and 69, Lancaster-gate, W.*
1868		Bright, Henry Arthur, Esq. *Ashfield, Knotty Ash, Liverpool.*
1860		Bright, James, Esq., M.D. 12, *Wellington-square, Cheltenham.*
1854		Brine, Major Frederic, R.E. K.T.S., Executive Engineer, Punjaub. *Athenæum Club, S.W.; Army and Navy Club, S.W. Care of Mrs. F. Brine, Edgcumbe, Torquay.*
1856		Brine, Captain Lindesay, R.N. *Army and Navy Club, S.W.; All Saints' Rectory, Axminster. Care of Messrs. Woodhead.*
1861		Bristowe, Henry Fox, Esq.

Year of Election	
1861	Broadwater, Robert, Esq. 3, *Billiter-square, Fenchurch-street, E.C.*
1864	Brodie, G. S., Esq. 27, *Pembridge-square, W.*
1861	Brodie, Walter, Esq. 13, *Delamere-terrace, Hyde-park, W.*
1861	Brodie, William, Esq. *Eastbourne, Sussex.*
1863	280 *Brodrick, Hon. George C. 32A, *Mount-street, W.*
1864	*Brooke, Sir Victor A., Bart. *Colebrooke-park, Co. Fermanagh, Ireland.*
1862	Brookes, Thomas, Esq. *Mattock-lane, Ealing, W.*
1856	*Brooking, George Thomas, Esq. 25, *Sussex-gardens, Hyde-park, W.*
1856	*Brooking, Marmaduke Hart, Esq. 11, *Montagu-place, Bryanston-square, W.*
1863	*Broughall, William, Esq. *Broadwater, Down, Tunbridge-wells.*
1868	Brown, Col. David (Madras Staff Corps). 14, *St. James's-square, S.W.*
1856	*Brown, Daniel, Esq. *The Elms, Larkhall-rise, Clapham, S.*
1864	Brown, Edwin, Esq., F.G.S. *Burton-on-Trent.*
1867	Brown, Geo. H. Wilson, Esq. *Victoria, Vancouver Island, British Columbia. Care of H. C. Beeton, Esq.*, 5, *Bow-churchyard, E.C.*
1860	290 Brown, James, Esq. *Rossington, Yorkshire.*
1863	Brown, James P., Esq. *Cocaes, Brazil. Care of Mr. C. Williams*, 25, *Poultry, E.C.*
1865	*Brown, James R., Esq., F.R.S.N.A. Copenhagen. 5, *Langham-chambers, Langham-place, W.*
1867	Brown, Rev. J. C., LL.D., &c. *Haddington, Scotland.*
1861	*Brown, John Allen, Esq. *The Laurels, The Haven, Ealing, W.*
1867	Brown, Richard, Esq., C.E. 115, *Lansdowne-road, Notting-hill, W.*
1867	Brown, Robert, Esq. 4, *Gladstone-terrace, Hope-park, Edinburgh.*
1856	*Brown, Samuel, Esq. 11, *Lombard-st., E.C.; and The Elms, Larkhall-rise, Clapham, S.*
1858	*Brown, Thomas, Esq. 8, *Hyde-park-terrace, Hyde-park, W.*
1859	Brown, William, Esq. *Loat's-road, Clapham-park, S.*
1863	300 Browne, H. H., Esq. 70, *Westbourne-park-villas, Harrow-rd., Paddington, W.*
1862	Browne, John Comber, Esq., Superintendent and Inspector of Government Schools. *Port Louis, Mauritius.*
1869	Browne, Samuel Woolcott, Esq. 77, *Gloucester-terrace, Hyde-park, W.*
1864	*Browne, Capt. Wade. 6, *Charles-street, Berkeley-square, W.*
1858	Browne, William J., Esq. *Marston-lodge, Pitville, Cheltenham.*
1869	Browning, George Frederick, Esq. *Weston School, Bath.*
1852	Browning, H., Esq. 73, *Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.*
1856	*Browning, Thomas, Esq. 6, *Whitehall, S.W.*
1859	Bruce, Henry Austin, Esq. *Duffryn, Aberdare, Glamorganshire.*
1863	Brunton, John, Esq., M.I.C.E., F.G.S. *Care of Messrs. Willis and Sotheran, Charing-cross, S.W.*
1856	310 Bryant, Walter, Esq., M.D., F.R.C.S. 7, *Bathurst-street, Hyde-park-gardens, W.*
1843	*Buchan, John Hitchcock, Esq. *The Grove, Hanwell, W.*
1867	*Buccleuch, his Grace the Duke of, K.G., F.R.S. *Dalkeith Palace, near Edinburgh; and Montagu-house, Whitehall, S.W.*

Year of Election.		
1859		Buckland, Edward C., Esq. 36, *Lansdowne-road, Notting-hill, W.*
1869		Buckley, John, Esq. *Care of Messrs. Dalgety, Du Croz, and Co.,* 52, *Lombard-street, E.C.*
1863		Budd, J. Palmer, Esq. *Care of J. J. Milford, Esq.,* 13, *Austin-friars, E.C.*
1867		*Bulger, Capt. George Ernest, F.L.S., &c. *Care of Mr. Booth,* 307, *Regent-st., W.*
1868		*Bull, William, Esq., F.L.S. *King's-road, Chelsea, S.W.*
1865		Buller Sir Edward M., Bart., M.P. *Old Palace-yard, S.W.; and Dilhorn-hall, Cheadle, Staffordshire.*
1869		Buller, Walter L., Esq., F.L.S. *Wanganui, New Zealand.*
1863	320	Bullock, Commander Charles J., R.N. *Hydrographic-office, S.W.*
1830		*Bullock, Rear-Admiral Frederick. *Woolwich, S.E.*
1860		*Bunbury, Sir Charles James Fox, Bart.; F.R.S. *Barton-hall, Bury St. Edmund's.*
1839		Bunbury, E. H., Esq., M.A. 35, *St. James's-street, S.W.*
1863		Bundock, F., Esq. *Windham Club, S.W.*
1861		Burges, William, Esq. *Fethard, Co. Tipperary.*
1866		Burgess, James, Esq., M.R.A.S., Principal of Sir J. Jejeebhoy's Parsee B. Institution. *Hornby-row, Bombay. Care of J. McGlushan, Esq.,* 31, *Essex-st., Strand, W.C.*
1863		Burgoyne, Capt. Hugh Talbot R.N., V.C. 8, *Gloucester-gardens, Hyde-park, W.*
1864		Burn, Robert, Esq. 5, *Clifton-place, Sussex-square, W.*
1863		*Burns, John, Esq. 1, *Park-gardens, Glasgow; and Castle Wemyss, by Greenock, N.B.*
1861	330	*Burr, Higford, Esq. 23, *Eaton-place, S.W.; and Aldermanston-court, Berkshire.*
1857		Burstal, Capt. E., R.N. 6, *Park-villas, Lower Norwood, S.*
1830		*Burton, Alfred, Esq. 36, *Marina, St. Leonard's.*
1833		*Burton, Decimus, Esq., F.R.S. 37, *Gloucester-gardens, Hyde-park, W.*
1859		*Burton, Capt. Richd. Fras., 18th Regt. Bombay N.I., H.B.M. Consul at Damascus. 4, *St. James's-square, S.W. Care of R. Arnudell, Esq., Admiralty, Somerset-house, W.C.*
1869		Burton, William Samuel, Esq. *South-villa, Regent's-park, N.W.*
1858		Bury, William Coutts, Viscount. 48, *Rutland-gate, S.W.*
1861		Bush, Rev. Robert Wheler, M.A. 1 *Milner-square, Islington, N.*
1868		Busk, William, Esq., M.C.P., &c. 28, *Bessborough-gardens, S.W.*
1861		Butler, Charles, Esq. 3, *Connaught-place, Hyde-park, W.*
1867	340	Butler, E. Dundas, Esq. *Geographical Department, British Museum, W.C.*
1860		*Butler, Rev. Thomas. *Rector of Langar, Nottinghamshire.*
1862		*Buxton, Chas., Esq., M.P. 7 *Grosvenor-crescent, S.W.; and Fox-warren, Surrey.*
1869		Buxton, Henry Edmund, Esq., B.A. 3, *Hanover-terrace, Regent's-park, N.W.*
1858		*Buxton, Sir Thomas Fowell, Bart. *Brick-lane, N.E.*
1866		Byass, Robert B., Esq. *Melville-park, Tunbridge-wells.*
1864		Bythesea, Capt. J., R.N., V.C. 20, *Grosvenor-place, Bath. Care of G. J. Noel, Esq., Admiralty, S.W.*

Year of Election.	
1830	*Cabbell, B. B., Esq., M.A., F.R.S., F.S.A. 1, *Brick-court, Temple, E.C.*; 52, *Portland-place, W.; and Aldwick, Sussex.*
1866	Caldbeck, Capt. J. B. (P. and O. Sup. at Aden). 17, *West Mall, Clifton, and* 122, *Leadenhall-street, E.C. Care of Mrs. Caldbeck,* 76, *Englefield-road, N.*
1863	Callaghan, Thos. F., Esq. *Garrick Club, W.C.*
1861	350 Calthorpe, the Hon. Augustus Gough. 33, *Grosvenor-square, W.*
1855	*Calthorpe, F. H. Gough, Lord. 33, *Grosvenor-square, W.*
1854	Calvert, Frederic, Esq., Q.C. 5, *Tinley-street, Park-lane, W.; and* 8, *New-square, Lincoln's-inn, W.C.*
1858	Cameron, Capt. Charles D. *Care of E. Hertslet, Esq., Foreign-office, S.W.*
1861	Cameron, Donald, Esq., M.P. *Auchnacarry, Invernesshire.*
1858	Cameron, Major-General Sir Duncan Alexander, R.E. C.B. *New Zealand.*
1864	Cameron, J., Esq. *Singapore. Care of Messrs. H. S. King and Co.*
1866	Cameron, R. W., Esq. *Staten Island, New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.*
1861	Campbell, Capt. Frederick, R.N. 12, *Connaught-place, Hyde-park, W.*
1866	Campbell, George, Esq. 60, *St. George's-square, Pimlico, S.W.; and Athenæum Club, S.W.*
1844	360*Campbell, James, Esq. *Grove-house, Hendon, Middlesex; and* 37, *Seymour-street, W.*
1857	Campbell, James, Esq., Surgeon R.N. *Bangkok, Siam. Care of Messrs. H. S. King and Co.*
1834	*Campbell, James, Esq., jun. *Hampton-court-green, S.W.*
1863	*Campbell, James Duncan, Esq. *Peking. Care of H. C. Batchelor, Esq.,* 155, *Cannon-street, E.C.*
1869	Campbell, Robert, Esq., J.P. 31, *Lowndes-square, S.W.; and Buscot-park, Lechlade, Gloucestershire.*
1857	Camps, William, Esq., M.D. 84, *Park-street, Grosvenor-square, W.*
1866	Canning, Sir Samuel, C.E. *The Manor-house, Abbots Langley, near Watford, Herts.*
1864	Cannon, John Wm., Esq. *Castle-grove, Tuam.*
1857	Cannon, Lieut.-General R. 10, *Kensington-gardens-terrace, W.*
1853	*Cardwell, Right Hon. Edward, M.P. 74, *Eaton-square, S.W.*
1863	370*Carew, R. Russell, Esq., J.P. *Carpenders-park, Watford, Herts; and Oriental Club, W.*
1869	Carey, Rev. Tupper. *Fifield, Bavant, Salisbury.*
1862	Cargill, John, Esq., Member of the Legislative Assembly of New Zealand and Legislative Council of Otago. *Dunedin, Otago, New Zealand.*
1863	*Cargill, Wm. W., Esq. 4, *Connaught-place, Hyde-park, W.*
1864	*Carmichael, L. M., Esq., M.A., 5th Lancers. *Oxford and Cambridge Club, S.W.*
1865	*Carnegie, David, Esq. *Eastbury, by Watford, Herts.*
1863	Carnegie, Commander, the Hon. J., R.N. 26, *Pall-mall, S.W.*
1869	Carr, William, Esq. *Dene-park, near Tunbridge.*

Year of Election.		
1864		Carrington, R. C., Esq. *Admiralty, S.W.*
1861		Carter, Captain Hugh Bonham, Coldstream Guards. *Guards' Club, S.W.; and* 1, *Carlisle-place, Victoria-street, S.W.*
1868	380	Carter, Thomas Tupper, Esq., Lt. R.E. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall.*
1860		Cartwright, Capt. Henry, F.S.A. *Barbican-lodge, Gloucester.*
1857		Cartwright, Col. Henry, Grenadier Guards, M.P. 1, *Tilney-street, Park-street, Grosvenor-square, W.*
1860		*Carver, the Rev. Alfred J., D.D., Master of Dulwich College. *Dulwich, S.E.*
1858		Casella, Louis P., Esq. 23, *Hatton-garden, E.C.; and South-grove, Highgate, N.*
1860		Cave, Amos, Esq. 109, *New-road, Kennington-park, S.; and Rathbone-place, Oxford-street, W.*
1857		Cave, Capt. Laurence Trent. 75, *Chester-square, W.*
1858		Cave, Right Hon. Stephen, M.P. 35, *Wilton-place, S.W.*
1863		Challis, John Henry, Esq. *Reform Club, S.W.*
1865		Chambers, Charles Harcourt, Esq., M.A. 2, *Chesham-place, S.W.*
1864	390	Chambers, David, Esq. *Paternoster-row, E.C.*
1858		Champion, John Francis, Esq. *High-street, Shrewsbury.*
1866		*Chandless, Wm., Esq., B.A. 1, *Gloucester-place, Portman-square, W.*
1867		Chapman, James, Esq. *Cape Town, Cape of Good Hope.*
1863		*Chapman, Spencer, Esq. *Roehampton, S.W.*
1860		Charlemont, Lord. *Charlemont-house, Dublin.*
1861		Charnock, Richard Stephen, Esq., PH.Dr., F.S.A. 8, *Gray's-inn-square, W.C.; and The Grove, Hammersmith.*
1864		Cheadle, Walter, Esq., B.A., M.D. Camb. 2, *Hyde-park-place, Cumberland-gate, W.*
1861		Cheetham, John Frederick, Esq. *Eastwood, Staleybridge.*
1855		Cheshire, Edward, Esq. *Conservative Club, S.W.*
1838	400	*Chesney, Major-General Francis Rawdon, R.A., D.C.L., F.R.S. *Athenæum Club, S.W.; and Ballyardle, Down, Ireland.*
1858		Chetwode, Augustus L., Esq. 7, *Suffolk-street, Pall-mall-east, S.W.; and Chilton-house, Thame, Oxfordshire.*
1858		Childers, Right Hon. Hugh C. E., M.P. 17, *Prince's-gardens, W.; and Australia.*
1856		Childers, John Walbanke, Esq. *Cantley-hall, near Doncaster.*
1857		*Chimmo, Commr. William, R.N. *Hydrographic-office, S.W.*
1869		Chinnock, Frederick George, Esq. 37, *Portland-place, W.*
1830		*Church, W. H., Esq.
1849		Churchill, Lord Alfred Spencer. 16, *Rutland-gate, S.W.*
1856		Churchill, Charles, Esq. *Weybridge-park, Surrey.*
1853		Clarendon, George William, Earl of, K.G., G.C.B. 1, *Grosvenor-crescent, S.W.; The Grove, Watford, Herts; and Hindon, Wilts.*
1863	410	Clark, Lieut. Alex. J. 14, *St. James's-square, S.W.; and Eveswell-house, Maindee, Newport, Monmouthshire.*
1866		Clark, J. Howarth, Esq. *Cheetham Collegiate-school, Manchester.*
1840		*Clark, Sir James, Bart., M.D., F.R.S. *Bagshot-park, Surrey.*

Year of Election.		
1868		Clark, John Gilchrist, Esq. *Speddock, Dumfries, Dumfriesshire.*
1862		Clark, Latimer, Esq. 1, *Victoria-street, Westminster, S.W.; and Cairo.*
1868		Clark, William, Esq. *The Cedars, South Norwood.*
1859		Clark, Rev. W. Geo., M.A. *Trinity College, Cambridge.*
1865		Clark, W. H., Esq. 6, *Leinster-terrace, Hyde-park, W.*
1859		Clarke, Capt. A., R.E. *Army and Navy Club, S.W.*
1855		*Clarke, Rev. W. B., M.A. *St. Leonard's, Sydney, New South Wales. Care of Messrs. Richardson, Cornhill.*
1868	420	Clarke, W., Esq. 15, *Ladbroke-grove, W.*
1862		Claude, Eugène, Esq. *Villa Helvetia, Carlton-road, Tufnell-park, N.*
1842		*Clavering, Sir William Aloysius, Bart., M.A. *United University Club, S.W. Axwell-park, near Gateshead; and Greencroft, Durham.*
1863		Clayton, Capt. John W., late 15th Hussars. 14, *Portman-square, W.*
1866		Clayton, Sir W. R. *Harleyford, Great Marlow, Bucks.*
1866		*Cleghorn, Hugh, Esq., M.D., Conservator of Forests, Madras. *Stravithy, St. Andrew's.*
1863		Clements, Rev. H. G. *United University Club, S.W.*
1860		Clerk, Capt. Claude. *Military Prison* (*Queen's Bench*), *Southwark, S.*
1858		Clermont, Thomas, Lord. *Ravensdale-park, Newry, Ireland.*
1845		*Cleveland, His Grace the Duke of. *Cleveland-house*, 17, *St. James's-square, S.W.*
1861	430	Clifford, Sir Charles. *Campden-house, Broadway, Worcestershire.*
1858		Clifford, Charles Cavendish, Esq. *House of Lords, S.W.*
1866		Clinton, Lord Edward. *Army and Navy Club, S.W.*
1865		Clipperton, Robert Charles, Esq., H.B.M. Consul, Kertch. *Care of T. G. Staveley, Esq., Foreign-office, S.W.*
1856		Clive, Rev. Archer. *Whitfield, Hereford.*
1863		Clowes, E., Esq. *Salisbury-square, Fleet-street, E.C.*
1854		Clowes, George, Esq. *Duke-street, Stamford-street, Blackfriars, S.E.; Charing-cross, S.W.; and Surbiton, Surrey.*
1864		Clowes, Rev. George, B.A. *Surbiton, Surrey.*
1854		Clowes, William, Esq. *Duke-street, Stamford-street, Blackfriars, S.E.; Charing-cross, S.W.; and* 51, *Gloucester-terrace, Hyde-park, W.*
1861		Clowes, William Charles Knight, Esq., M.A. *Duke-street, Stamford-street, Blackfriars, S.E.; and Surbiton, Surrey.*
1852	440	Cobbold, John Chevalier, Esq. *Athenæum Club, S.W.; and Ipswich, Suffolk.*
1859		*Cochrane, Capt. the Hon. A., R.N., C.B. *Junior United Service Club, S.W.*
1869		Cockburn, Captain James George, Rawul Pindee, Bengal. *Care of Colonel Cockburn, Bracon Ash, Norwich.*
1862		Cockerton, Richard, Esq. 12, *Petersham-terrace, South Kensington, W.*
1862		Cockle, Captain George. 9, *Bolton-gardens, South-Kensington, W.*
1859		Cocks, Colonel C. Lygon, Coldstream Guards. *Crediton, Devon.*
1865		Cocks, Major Octavius Yorke. 180, *Piccadilly, W.*
1841		*Cocks, Reginald Thistlethwayte, Esq. 43, *Charing-cross, S.W.; and* 22, *Hertford-street, Mayfair, W.*

Year of Election.	
1857	Coghlan, Edward, Esq. *Training-institution, Gray's-inn-road, W.C.*
1861	Coghlan, J., Esq., Engr.-in-Chief to the Government. *Buenos Ayres. Care of Messrs. J. Fair and Co., 4, East India-avenue, Leadenhall-street, E.C.*
1862	450 Coghlan, Major Gen. Sir William M., K.C.B., R.A. *Ramsgate, Kent.*
1865	Colchester, Reginald Charles Edward, Lord. *All Souls' College, Oxford.*
1868	Cole, William H., Esq. 23, *Portland-place, W.*
1867	Colebrook, John, Esq. 15, *St. Leonard's-terrace, King's-road, Chelsea, S.W.*
1841	*Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 37, *South-st., Park-lane, W.*
1834	Colebrooke, Lt.-General Sir Wm., R.A., M.G., C.B., K.H., F.R.A.S. *Datchet, near Windsor; and United Service Club, S.W.*
1854	Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office, Adelaide-place, London-bridge, E.C.*
1848	Coles, Charles, jun., Esq. 86, *Great Tower-street, E.C.*
1835	*Collett, William Rickford, Esq. *Carnarvon; and Carlton Club, S.W.*
1867	Collier, C. T., Esq. (Barrister of the Middle Temple). *Cedar-villa, Sutton, Surrey; and Oriental Club, W.*
1858	460 Collinson, Henry, Esq.
1866	Collinson, John, Esq., C.E. 9, *Clarendon-gardens, Maida-hill, W.*
1855	Collinson, Vice-Admiral Richard, C.B. *Haven-lodge, Ealing, W.; and United Service Club, S.W.*
1866	Collison, Francis, Esq. *Herne-hill, Surrey, S.*
1864	Colnaghi, Dominic E., Esq. *Care of F. B. Alston, Esq., Foreign-office, S.W.*
1862	Colquhoun, Sir Patrick, M.A.
1866	Colquhoun, Sir Robert G., K.C.B. 6, *Ulster-terrace, Regent's-park, N.W. and* 14, *Arlington-street, W.*
1869	Colvill, William H., Esq., Surg. H.M. Ind. Army. *Lawn-bank, Hampstead; and Baghdad.*
1861	*Colville, Charles John, Lord. 42, *Eaton-place, S.W.*
1865	Colvin, Binney J., Esq. 71, *Old Broad-street, E.C.*
1868	470 Colvin, Captain W. B. *Shirley-cottage, Croydon.*
1868	Combe, Lieut. B. A.
1861	Combe, Thomas, Esq., M.A. *University Press, Oxford.*
1864	Commerell, Commr. J. E., R.N., V.C. *Alverbank, near Gosport.*
1864	Conder, John, Esq. *Hallbrooke-house, New Wandsworth, S.W.*
1868	Coney, Rev. T., M.A. *Chaplain to the Forces, Chatham.*
1861	Constable, Capt. Chas. Golding, I.N. 68, *Hamilton-ter., St. John's-wood, N.W.*
1868	Cook, Edward, Esq. *Kingston-on-Thames.*
1868	Cook, H. Esq., M.D., &c. *Care of Messrs. Forbes and Co.,* 12, *Leadenhall-st., E.C.*
1863	Cooke, Lt.-Colonel A. C., R.E. *Topographical Department,* 4, *New-street, Spring-gardens, S.W.*
1863	480*Cooke, E. W., Esq., A.R.A., F.R.S., F.L.S., F.Z.S., F.G.S., Accad. Bell. Art. Venet. et Holm Socius. *Glen-Andred, Groombridge, Sussex, and Athenæum Club, S.W.*
1856	Cooke, John George, Esq. 18, *Pelham-place, Brompton, S.W.*
1866	Cooke, Rev. J. Hunt. *Victoria-house, Southsea, Hants.*
1860	Cooke, Nathaniel, Esq. 5, *Ladbrooke-terrace, Notting-hill, W.*

Year of Election.		
1852		Cooke, Robt. F., Esq. 50, *Albemarle-street, W.*
1860		Cooke, William Henry, Esq., Barrister-at-Law. 4, *Elm-court, Temple, E.C.*
1830		Cooley, William Desborough, Esq. 13, *College-place, Camden-town, N.W.*
1862		Cooper, Sir Daniel. 20, *Prince's-gardens, Hyde-park, S.W.*
1856		Cooper, Lt.-Col. Edward, Grenadier Guards. 5, *Bryanston-square, W.*
1860		Cooper, Lt.-Col. Joshua H., 7th Fusiliers. *Dunboden, Mullingar.*
1857	490	*Coote, Captain Robert, R.N. *Shales, Bittern, Southampton.*
1862		Cope, Walter, late H.M.'s Chargé d'Affaires at the Equador. 14, *The Terrace, Camberwell, S.*
1853		Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster.*
1864		Cork and Orrery, Earl of. 1, *Grafton-street, W.*
1868		Cork, Nathaniel, Esq. *Ivy-lodge*, 9, *Warwick-road, Upper Clapton, N.E.*
1868		Corner, William M., Esq. *Cobden-house, Leytonstone; and* 104, *Leadenhall-street, E.C.*
1868		*Cornish-Brown, Charles, Esq. 7, *Lansdowne-place, Clifton, Bristol.*
1865		Cornthwaite, Rev. T., M.A. *Forest, Walthamstow.*
1860		Cornwell, James, Esq., PH. DR. *Trev'er-byn, Dartmouth-park, Forest-hill.*
1839		*Corrance, Frederick, Esq. *Parkham-hall, Wickham Market, Suffolk.*
1868	500	Cory, Frederic C., Esq., M.D. 8, *Nassau-place, Commercial-road, S.*
1869		Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N.W.*
1853		*Cosway, William Halliday, Esq. *Oxford and Cambridge Club, S.W.*
1863		Courtenay, L. W., Esq. *British Post-office, Constantinople. Care of R. Wood, Esq.*, 139, *Fleet-street.*
1865		Cowan, John E., Esq. 58, *Denbigh-street, S.W.*
1862		Coward, William, Esq. 7, *Southsea-terrace, Southsea, Portsmouth.*
1857		*Cowell, Major Sir J. C., K.C.B., R.E. *Buckingham-palace, S.W.*
1854		Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
1862		Cowper, Sedgwick S., Esq. *Rookwood, Rockhampton, Queensland.*
1862		Cox, Mr. Sergeant, Barrister-at-Law, Recorder of Falmouth. 1, *Essex-court, Temple, E.C.; and Moat-mount, High-wood, Middlesex.*
1865	510	Coysh, John S., Esq. *Levant-house, St. Helen's-place, E.C.*
1867		Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*
1857		Craufurd, Lieut.-General James Robertson, Grenadier Guards. *Travellers' Club, S.W.; and* 36, *Prince's-gardens, W.*
1848		Crawford, Robert Wigram, Esq., M.P. 71, *Old Broad-street, E.C.*
1866		Crawfurd, O. J., Esq. *Athenæum Club, S.W.*
1861		Creswell, Rev. S. F., M.A. *The Grammar School, Dartford, North Kent.*
1859		*Creyke, Capt. Richard Boynton, R.N. *Ulverstone, Lancashire.*
1856		Croker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*
1864		Croll, A. A., Esq., C.E. *Southwood, Southwood-lane, Highgate.*
868		Croll, Alex., Esq. 16, *The Boltons, Brompton, S.W.*
860	520	*Croskey, J. Rodney, Esq. *Forest-house, High Beech, Essex.*
860		Crosse, the Rev. Thomas, D.C.L., M.R.A.S. *Hastings.*
862		Crossman, James Hiscutt, Esq. *Rolls-park, Chigwell, Essex.*

Year of Election.	
1863	*Crowder, Thos. Mosley, Esq., M.A. *Thornton-hall, Bedale, Yorkshire.*
1852	Crowdy, James, Esq. 17, *Serjeant's-inn, E.C.*
1859	Cull, Richard, Esq., F.S.A. 13, *Tavistock-street, Bedford-square, W.C.*
1857	Cumming, William Fullarton, Esq., M.D. *Athenæum Club, S.W.; Kinellan, Edinburgh.*
1860	Cunliffe, Roger, Esq. 24, *Lombard-street, E.C.; and* 10, *Queen's-* *South Kensington, W.*
1864	Cunningham, H. Esq.
1853	Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; Harrow, N.W.*
1862	530 *Cunynghame, Major-Gen. A. T., C.B. *Commanding Dublin Division, R* *Barracks, Dublin.*
1865	Cure, Capel, Esq. 51, *Grosvenor-street, W.*
1868	Currie, A. A. Hay, Esq., C.E. *The Manor-house, Tunbridge-wells.*
1843	*Cursetjee, Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*
1839	*Curtis, Timothy, Esq.
1865	Curzon, Hon. R. 24, *Arlington-street, W.; and Parham-park, Steyning, Sus*
1867	Cuttance, John Fras. J., Esq. *Cleveland-house, Greville-road, Kilburn, N.*

1864	Dallas, A. G., Esq. 36, *Beaufort-gardens, W.*
1863	*Dalgety, Fred. G., Esq. 8, *Hyde-park-terrace, W.*
1865	D'Almeida, W. B., Esq. 19, *Green-park, Bath.*
1863	540 Dalrymple, Donald, Esq. *Thorpe-lodge, Norwich.*
1867	Dalrymple, Geo. Elphinstone, Esq. *Logie, Elphinstone, Aberdeenshire.*
1857	Dalton, D. Foster Grant, Esq. *Shanks-house, near Wincanton, Somerset.*
1859	Dalyell, Sir Robt. Alex. Osborn, Bart. *H.M.'s Consul at Jassy; and* 1 *Belgrave-road, S.W.*
1868	Dalziel, William R., Esq. 5, *Gresham-park, Brixton, S.*
1866	Damer, Lt.-Col. Lionel S. Dawson. 2, *Chapel-street, Grosvenor-square, W.*
1862	Darvall, John Bayly, Esq.
1838	*Darwin, Charles, Esq., M.A., F.R.S. 6, *Queen Anne-street, Cavendish-square,*
1860	Dasent, John Bury, Esq. 22, *Warwick-road, Maida-hill, W.*
1863	Davies, R. H., Esq.
1866	550 Davis, Edmund F., Esq. 6, *Cork-street, Bond-street, W.*
1858	Davis, Dr. Francis William, Surgeon R.N. *H.M.S. 'Alert;' and Elm-lo* *St. Ann's-hill, Wandsworth, S.W.*
1866	Davis, Frederick E., Esq. 20, *Blandford-square, N.W.*
1868	Davis, Richard, Esq. 9, *St. Helen's-place, E.C.*
1861	Davis, Staff-Commander John Edward, R.N. *Hydrographic-office, Admiralty, S.*

Year of Election		
1846		Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenæum Club, S. W. and Hollywood, near Bristol.*
1840		*Dawnay, the Hon. Payan. *Beningborough-hall, Newton-upon-Ouse, Yorkshire.*
1865		Debary, Rev. Thomas, M.A. 35, *Mount-street, W.*
1866		Debenham, William, Esq. 3, *Porchester-square, Hyde-park, W.*
1859		De Blaquiere, John, Lord. 9, *Stratford-place, W.*
1858	560	De Bourgho, T. J., Esq. 6, *Charing-cross, S.W.*
1856		De Crespigny, Lieut. C., R.N.
1856		De Gex, William Francis, Esq. 25, *Throgmorton-street, E.C.*
1853		De Grey and Ripon, George Frederick Samuel, Earl. 1, *Carlton-gardens, S.W.; and Studley Royal, Ripon.*
1865		De Laski, A., Esq.
1869		De Leon, Dr. Hananel. 15, *Holland-villas-road, Kensington, W.*
1868		Dell, William, Esq. *Messrs. Combe, Delafield, and Co., Long Acre.*
1862		Denham, Adm. Sir Henry Mangles, R.N., K.C.B. 21, *Carlton-road, Maida-vale, W.*
1860		Denison, Alfred, Esq. 6, *Albemarle-street, W.*
1834		*Denison, Sir William Thomas, K.C.B., Lieut.-Col. R.E., F.R.S. *Observatory, East Sheen.*
1836	570	Denman, Rear-Admiral the Hon. Joseph. *Commander-in-Chief, Pacific; and* 17, *Eaton-terrace, S. W.*
1853		*Derby, Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, *St. James's-square, S.W.; and Knowsley-park, Prescott, Lancashire.*
1867		De Salis, Col. Rodolph, C.B. 123, *Pall-mall, S.W.*
1853		De Wesselow, Lieut. Fras. G. Simpkinson, R.N. 55, *Victoria-street, Westminster, S.W.*
1854		*Devaux, Alexander, Esq. 2, *Avenue-road, Regent's-park, N.W.*
1837		*Devonshire, William Cavendish, Duke of, LL.D., D.C.L., M.A., F.R.S. *Devonshire-house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.*
1864		Dick, A. H. Esq., M.A., L.L.B. *Free Church Normal College, Glasgow.*
1862		Dick, Capt. Charles Cramond. *Exeter, Devon.*
1866		*Dick, Fitzwilliam, Esq., M.P. 20, *Curzon-street, Mayfair, W.*
1861		Dick, Robert Kerr, Esq., Bengal Civil Service. *Oriental Club, W.*
1866	580	Dick, William Græme, Esq. 29, *Leinster-square, W.*
1854		*Dickenson, Sebastian Stewart, Esq., M.P., Barrister-at-Law. *Brown's-hill, Stroud, Gloucestershire.*
1830		*Dickinson, Francis Henry, Esq., F.S.A. 119, *St. George's-square, Pimlico, W.; and Kingweston-park, Somerset.*
1852		Dickinson, John, Esq., jun. 3, *Essex-court, Temple, E.C.; and Abbott's-hill, Hemel-Hempstead.*
1859		Dickson, A. Benson, Esq. 4, *New-square, Lincoln's-inn, W.C.*
1858		Dickson, Charles Hanmer, Esq., H.B.M. Consul, Súkum Kalé, Black Sea. *Care of J. Murray, Esq., Foreign-office, S.W.*
1860		Dietz, Bernard, Esq., of Algoa Bay. 3, *Dorset-square, W.*
1859		Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*

Year of Election.		
1860		Digby, Lieut.-Col. John Almerus. *Chalmington-house, Cattstock, Dorchester.*
1869		Digby, Kenelm T. Esq., M.P. *Shaftesbury-house, Kensington, S. W.*
1859	590	*Dilke, Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S. W.*
1856		Dillon, the Hon. Arthur. 17, *Clarges-street, W.*
1864		Dimsdale, J. C., Esq. 50, *Cornhill, E.C.; and* 52, *Cleveland-square, S. W.*
1867		Dix, Thomas, Esq. 10, *Amwell-street, W.C.*
1861		Dixon, Lieut.-Colonel John. 18, *Seymour-street, Portman-square.*
1854		Dixon, W. Hepworth, Esq., F.S.A. 6, *St. James's-terrace, Regent's-park, N. W.*
1857		Dobie, Robert, Esq., M.D., R.N. 7, *Houghton-pl., Ampthill-sq., Hampstead-rd., N. W.*
1854		Dodson, John George, Esq., M.P. 6, *Seamore-place, Mayfair, W.*
1854		Domville, William T., Esq., M.D., R.N. *Army and Navy Club, S. W.; Naval Dockyard, Malta.*
1867		Donald, James, Esq. 20, *Melville-terrace, Edinburgh.*
1858	600	Donne, John, Esq. *Instow, North Devon.*
1864		Doran, Dr. John, F.S.A. 33, *Lansdowne-road, Notting-hill, W.*
1868		Douglas, James A., Esq. 14, *Porchester-square, W.*
1868		Douglas, John, Esq. *Angas-lodge, Portsea.*
1868		Douglas, Capt. N. D. C. F. *Guards' Club, S. W.*
1850		Dover, John William, Esq. 132, *Stanley-street, Belgravia, S. W.*
1853		Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
1845		*Drach, Solomon Moses, Esq. F.R.A.S. 39, *Howland-street, Fitzroy-square, W.*
1869		Drake, Francis, Esq., F.G.S. *Leicester.*
1864		Drew, Major H. 14, *St. James's-square, S. W.*
1869	610	Drummond, Alfred, Esq. *Charing-cross, S. W.*
1865		Drummond, E. A., Esq. 2, *Bryanston-square, W.*
1846		Drummond, Lieut.-General John. *The Boyce, Dymock, Gloucestershire.*
1846		Drury, Capt. Byron, R.N. *The United Service Club, S. W.*
1851		*Du Cane, Major Francis, R.E. 64, *Lowndes-square, S. W.*
1851		*Ducie, Henry John, Earl, F.R.S. 30, *Prince's-gate, S. W.*
1859		Duckworth, Henry, Esq. *Holmfield-house, Aigburth, near Liverpool.*
1860		*Duff, Right Hon. Mountstuart Elphinstone Grant, M.P. 4, *Queen's-gate-gardens, South Kensington, W.*
1868		Duff, Wm. Pirie, Esq. *Calcutta. Care of Messrs. John Watson, and Co.,* 34, *Fenchurch-street, E.C.*
1857		*Dufferin, Right Hon. Lord, K.P., K.C.B. *Dufferin-lodge, Fitzroy-park, Highgate, N.*
1866	620	*Dugdale, Captain Henry Charles G. *Merevale-hall, Atherstone, Warwick.*
1867		*Dugdale, John, Esq. 1, *Hyde-park-gardens; and Llwyn, Llanfyllin, Oswestry.*
1868		Dunbar, John Samuel A., Esq. 28, *Pembridge-crescent, Bayswater, W; and* 4, *Barnard's Inn, Holborn.*
1863		Duncan, Capt. Francis, R.A., M.A., F.R.S. 32, *The Common, Woolwich, S.E.*
1861		*Duncan, George, Esq. 45, *Gordon-square, W.C.*
1840		*Dundas, Right Hon. Sir David, Q.C. 13, *King's-Bench-walk, Temple, E.C.; and Ochtertyre, Stirling.*

Year of Election.	
1860	Dunell, Henry James, Esq. 12, *Hyde-park-square, W.*
1859	*Dunlop, R. H. Wallace, Esq., C.B., Indian Civil Service. *Lakefield, Glen Urquhart, Inverness-shire.*
1860	*Dunmore, Charles Adolphus Murray, Earl of. 24, *Carlton-house-terrace, S.W.*
1868	Dunn, Capt. F. J. A. *Portillon, Tours, France, and* 4, *Cambrian-grove, Gravesend, E.C.*
1837	630*Dunraven, Edwin Richard, Earl of, F.R.S. *Adare-manor, Limerick; and Dunraven-castle, Glamorganshire.*
1856	Duprat, Chevalier Alfredo. *H.M.F. 'Arbitrator,' Cape Town, Cape of Good Hope. Care of Jas. Searight, Esq.,* 7, *East-India-avenue, E.C.*
1869	Durham, Edward, Esq., *Beauchamp-house, Kibworth, near Leicester.*
1852	D'Urban, M.-Gen. W. J. *Deputy Quartermaster-General, Canada; U. S. Club, S.W.; and Newport, near Exeter.*
1865	Dutton, F. S., Esq. *Reform Club, S.W.; and Adelaide, Australi*
1868	Dutton, Frederick H., Esq. 45, *Dover-street, W.*
1867	Eadie, Robert, Esq. *Blaydon-on-Tyne, Durham.*
1854	Eardley-Wilmot, Capt. A. P., R.N., C.B. *Deptford Dockyard, E.*
1856	Eardley-Wilmot, Major-Gen. F., M.R.A. 22, *Victoria-rd., Clapham-common, S.W.*
1857	Eastwick, Captain W. J. 12, *Leinster-terrace, Hyde-park, W.*
1863	640 Eaton, F. A., Esq. *New University Club, St. James's-street, S.W.*
1862	*Eaton, H., Esq. 16, *Prince's-gate, Hyde-park, W.*
1862	*Eaton, Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, W.*
1864	*Eaton, William Meriton, Esq., 16, *Prince's-gate, Hyde-park, W.*
1866	Eatwell, Surgeon-Major W. C. B., M.D. 17, *Kensington-park-terrace, Notting-hill, W.*
1861	Eber, General F. 33, *St. James's-square, S.W.*
1862	Ebury, Lord. 107, *Park-street, Grosvenor-square, W.; and Moor-park, Herts.*
1862	Eden, Vice-Adm. Charles, C.B. 20, *Wilton-place, S.W.*
1858	Edge, Rev. W. J., M.A. *Benenden-vicarage, near Staplehurst, Kent.*
1863	Edgeworth, M. P., Esq., BENG. C.S. *Mastrim-house, Anerly, S.*
1867	650*Edward, James, Esq. *Balruddery, by Dundee, N.B.*
1866	*Edwardes, Thomas Dyer, Esq. 5, *Hyde-park-gate, Kensington, W.*
1868	Edwards, Rev. A. T., M.A. 39, *Upper Kennington-lane, S.*
1865	Edwards, G. T., Esq., M.A. *Devon-lodge, Alexandra-road, London, N.W.*
1861	*Edwards, Henry, Esq. 53, *Berkeley-square, W.*
1860	Edwards, Major J. B., R.E. *United Service Club, S.W. Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C.*
1853	Egerton, Captain the Hon. Francis, R.N., M.P. *Bridgewater-house, S.W.; and H.M.S. 'St. George.'*

Year of Election.		
1868		Elder, A. L., Esq. *Carlisle-house, Hampstead.*
1863		*Elder, George, Esq. *Knock-castle, Ayrshire.*
1867		Eley, Charles John, Esq. *Old Brompton, S.W.*
1865	660	Elias, Ney, Jun., Esq. 64, *Inverness-terrace, Bayswater, W.*
1845		Ellenborough, Edward, Earl of, G.C.B. *Southam-house, near Cheltenham.*
1863		Ellerton, John L., Esq. 6, *Connaught-place, Hyde-park, W.*
1860		Elliot, G., Esq., M.P., C.E. *The Hall, Houghton-le-Spring, near Fence Houses, Durham.*
1857		*Elliot, Capt. L. R. *La Mailleraye-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq.*, 10, *Connaught-place, W.*
1830		*Elliott, Rev. Charles Boileau, M.A., F.R.S. *Tattingstone, Suffolk.*
1868		Ellis, C. H. Fairfax, Esq., Lieut. R.A. *Shoeburyness, Essex.*
1865		Ellis, W. E. H., Esq. *Hasfield-rectory, Gloucester; Oriental Club, W.; and Byculla Club, Bombay.*
1858		Elphinstone, Major Howard C., R.E. *Buckingham-palace, S.W.*
1869		Elsey, Colonel William. *West-lodge, Ealing, W.*
1857	670	Elton, Sir A. H., Bart. *Athenæum Club, S.W.; and Clevedon-court, Somersetshire.*
1868		Ely, John Henry Wellington Graham Loftus, Marquis of. 9, *Prince's-gate, W.*
1862		*Emanuel, Harry, Esq. 8, *Clarence-terrace, Regent's-park, N.W.*
1866		Emanuel, Joel, Esq., F.A.S. *Norfolk-villa, Lansdowne-road, Notting-hill, W.*
1863		Emslie, John, Esq. 47, *Gray's-inn-road, W.C.*
1830		Enderby, Charles, Esq., F.R.S., F.L.S. 13, *Great St. Helen's, E.C.*
1860		Enfield, Edward, Esq., F.S.A. 19, *Chester-terrace, Regent's-park, N.W.*
1863		Engleheart, Gardner D., Esq. 1, *Eaton-place-south, S.W.*
1852		Erskine, Admiral John Elphinstone, M.P., C.B. *H.M.S. 'Edgar;'* 1 *L, Albany, W.; and Cardross, Stirling, N.B.*
1857		*Esmeade, G. M. M., Esq. 29, *Park-street, Grosvenor-square, W.*
1865	680	Evans, Colonel William Edwyn. 24, *Great Cumberland-place, Hyde-park, W.*
1857		Evans, F. J., Esq., Staff Captain R.N., F.R.S., F.R.A.S. 4, *Wellington-terrace, Charlton, Blackheath, S.E.*
1830		*Evans, Vice-Admiral George. 1, *New-street, Spring-gardens, S.W.; and Englefield-green, Staines.*
1857		Evans, Thos. Wm., Esq. 1, *Dartmouth-street, Westminster, S.W.; and Allestree-wall, Derby.*
1830		*Evans, W. Esq.
1867		Evans, W. Herbert, Esq. 32, *Hertford-street, Mayfair, W.*
1861		Evelyn, Lieut.-Colonel George P. 84, *Onslow-gardens, Brompton, S.W.*
1851		*Evelyn, William J., Esq., F.S.A. *Evelyn Estate-office, Evelyn-street, Deptford.*
1830		*Everett, James, Esq., F.S.A.
1865		Everitt, George A., Esq. *Knowle-hall, Warwickshire.*
1856	690	Ewing, J. D. Crum, Esq. 21, *Birchin-lane, E.C.*
1869		Ewing, John Orr, Esq. *Levenfield-house, Alexandria, Dumbartonshire.*
1857		Eyre, Edward J., Esq.
1861		Eyre, George E., Esq. 59, *Lowndes-square, Brompton, S.W.*

Year of Election.		
1856		Eyre, Major-Gen. Sir Vincent, C.B. *Athenæum Club, S.W.; and 33, Thurloe-square, S.W.*
1861		Fairbairn, Sir William, Bart., C.E., F.R.S. *Manchester.*
1869		Fairfax, Captain Henry, R.N. *Army and Navy Club, S.W.*
1856		Fairholme, George Knight, Esq.
1866		Fairman, Edward St. John, Esq., F.G.S., &c. 874, *Via Santa Maria, Pisa. Care of H. Fairman, Esq.*
1838		Falconer, Thomas, Esq. *Usk, Monmouthshire.*
1868	700	Falconer, William, Esq. 23, *Leadenhall-street, E.C.; and* 42, *Hilldrop-road, Camden-new-town, N.*
1857		Falkland, Lucius Bentinck, Viscount. *Skutterskelfe, Yorkshire.*
1855		*Fanshawe, Admiral E. G. 63, *Eaton-square, S.W.*
1868		Farquharson, Lieut.-Col. G. McB. *Junior United Service Club, S.W.*
1863		*Farrer, W. Jas., Esq. 24, *Bolton-street, Piccadilly, W.*
1864		Faulkner, Charles, Esq., F.S.A., F.G.S. *Deddington, Oxon.*
1863		*Faunthorpe, Rev. J. P., M.A. *Training-college, Battersea.*
1869		Fawcett, Captain Edward Boyd, M.A. *Dunolly, Torquay.*
1869		Fawcett, Henry Esq. *Wainsford, Lymington.*
1853		*Fayrer, Joseph, Esq., M.D. *Calcutta. Care of General Spens,* 14, *Drummond-place, Edinburgh.*
1858	710	Fazakerley, J. N., Esq. 17, *Montagu-street, Portman-square, W.*
1866		Felkin, Wm., Esq., Jun., F.Z.S. *Beeston, near Nottingham.*
1864		Fergusson, J., Esq. 6, *Gloucester-square, Hyde-park.*
1840		*Fergusson, James, Esq., F.R.S. 20, *Langham-place, W.*
1863		Ferreira, Baron De. 12, *Gloucester-place, Portman-square, W.*
1860		Ferro, Don Ramon de Silva.
1865		Field, Hamilton, Esq. *Thornton-road, Clapham-park.*
1844		Findlay, Alex. George, Esq. 53, *Fleet-street, E.C.; and Dulwich-wood-park, S.*
1862		Finnis, Thomas Quested, Esq., Alderman. *Wanstead, Essex, N.E.*
1863		Fisher, John, Esq. 60, *St. James's-street, S.W.*
1869	720	Fitch, Frederick, Esq., F.R.M.S. *Hadleigh-house, Highbury-new-park, N.*
1857		*Fitzclarence, Commander the Hon. George, R.N.
1863		Fitzgerald, J. F. V., Esq. 11, *Chester-square, S.W.*
1861		Fitzgerald, Captain Keane. 2, *Portland-place, W.*
1864		Fitz-Patrick, Lieut. Francis Skelton, 42nd Regt. Madras Army.
1857		Fitzwilliam, the Hon. C. W., M.P. *Brooks' Club, St. James's-street, S.W.*
1837		*Fitzwilliam, William Thomas, Earl. 4, *Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.*
1865		*Fitzwilliam, Wm. S. Esq. 28, *Ovington-square, Brompton, S.W.*
1863		Fleming, G., Esq. *Brompton Barracks, Chatham.*
1861		*Fleming, John, Esq. 18, *Leadenhall-street, E.C.*
1865	730	Fleming, Rev. T. S. *Roscoe-place, Chapeltown-road, Leeds.*
1853		*Flemyng, Rev. Francis P.

Year of Election.	
1862	Fletcher, John Charles, Esq. *Dale-park, Arundel; and Eaton-place, S.W.*
1868	Fletcher, John Thompson, Esq. 15, *Upper Hamilton-terrace, St. John's-wood, N.W.*
1857	Fletcher, Thomas Keddey, Esq. *Union-dock, Limehouse, E.*
1866	Flood, John Edwin, Esq. 126, *High-street, Poplar, E.*
1864	Flower, Capt. L. *Banstead, Surrey; and Queen's United Service Club, S.W.*
1863	Foley, Col. the Hon. St. George, C.B. 24, *Bolton-street, W.*
1861	Foord, John Bromley, Esq. 52, *Old Broad-street, E.C.*
1860	Forbes, Commander Charles S., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1863	740 Forbes, Capt. C. J. F. Smith. 5, *Hatch-street, Dublin.*
1867	Forbes, Geo. Edward, Esq. *Union Club, S.W.;* 11, *Melville-street, Edinburgh; New Club, Edinburgh.*
1860	Forbes, Lord, M.A. *Castle Forbes, Aberdeenshire.*
1869	Ford, Col. Barnett, Governor of the Andaman Islands. 24, *Upper-park-road, Hampstead.*
1868	Forster, Hon. Anthony. *Newsham-grange, Winston, Darlington, Durham.*
1845	Forster, Rev. Charles, B.D. *Stisted-rectory, Essex.*
1839	*Forster, William Edward, Esq. *Burley, near Otley.*
1867	Forsyth, T. Douglas, Esq., C.B. (B.C.S.), Commissioner, Jullundhur, Punjab. *Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C.*
1861	Forsyth, William, Esq., M.P., Q.C. 61, *Rutland-gate, S.W.*
1858	Fortescue, Right Hon. Chichester S., M.P. 7, *Carlton-gardens, S.W.*
1861	750 *Fortescue, Hon. Dudley F., M.P. 9, *Hertford-street, Mayfair, W.*
1869	Foster, Ebenezer, Esq. 19, *St. James's-place, St. James's, S.W.*
1866	Foster, Edmond, Esq., Jun. 79, *Portsdown-road, Maida-vale, W.*
1864	Foster, H. J., Esq.
1864	Foster, Capt. W. J. *Stubingdon-house, Fareham, Hants.*
1863	*Fowler, J. T., Esq. *Government Inspector of Schools, Adyar, Madras, India. Care of Rev. A. Wilson, National Society's Office, Sanctuary, Westminster.*
1850	*Fowler, Robert N., Esq., M.P., M.A. 50, *Cornhill, E.C.; and Tottenham, N.*
1859	Fox, Lieut.-Colonel A. Lane. 10, *Upper Phillimore-gardens, Kensington, W.*
1830	*Fox, Lieut.-General C. R. *Travellers' Club, S.W.; and* 1, *Addison-road, Kensington, W.*
1866	Fox, D. M., Esq., Chief Engineer of the Santos and St. Paulo Railway. *St. Paulo, Brazil.*
1864	760 *Fox, F. E. Esq., B.A. *Elmslea, Tottenham, Middlesex.*
1865	Fox, Samuel Crane, Esq. *Longmoor-villa, Romford-road, E.*
1865	*Franks, Aug. W., Esq. 103, *Victoria-street, S.W.*
1860	Franks, Charles W., Esq. *Local Government Act Office,* 8, *Richmond-terrace, Whitehall.*
1867	Fraser, Edward John, Esq. (Solicitor). 1, *Percy-villas, Campden-hill, Kensington, W.*
1862	Fraser, Capt. H. A., I.N.

Year of Election.	
1860	Fraser, Thos., Esq.
1866	Fraser, Capt. T. *Otago, New Zealand.*
1868	Frater, Alexander, Esq. *Canton. Care of Thomas Frater, Esq., National Provincial Bank of England, Brecon, Wales.*
1869	Freke, Thomas George, Esq. 1, *Cromwell-houses, Kensington, W.*
1860	770 Freeman, Daniel Alex., Esq., Barrister-at-law. *Plowden-buildings, Temple, E.C.*
1868	Freeman, Henry W., Esq. *Junior Athenæum Club, S.W.*
1864	Fremantle, Lieut.-Col. Arthur. *Guards' Club, S.W.*
1863	Fremantle, Captain Edmund Robert, R.N. 4, *Upper Eccleston-street, S.W.*
1856	Fremantle, Rt. Hon. Sir Thomas F., Bart. 4, *Upper Eccleston-street, Belgrave-square, S.W.*
1864	Freme, Major James H. *Wrentnall-house, Shropshire; and Army and Navy Club, S.W.*
1850	Frere, Bartle John Laurie, Esq. 45, *Bedford-square, W.C.*
1839	*Frere, George, Esq. *Cape of Good Hope. Care of the Foreign-office, S.W.*
1867	Frere, Sir Hy. Bartle Edw., K.C.B., G.C. Star of India. 44, *Prince's-gardens, W.*
1842	Frere, William Edw., Esq., F.R.A.S. *The Rectory, Bitton, Gloucestershire.*
1859	780 Fryer, William, Esq. 39, *Marlborough-hill-gardens, St. John's-wood, N.W.*
1863	Fuidge, William, Esq. 5, *Park-row, Bristol.*
1860	Fussell, Rev. J. G. Curry. 16, *Cadogan-place, S.W.*
1868	Fyfe, Andrew, Esq., M.D. 112, *Brompton-road, S.W.*
1861	Fynes Clinton, Rev. Charles J., M.A. 3, *Montagu-place, Russell-square, W.C.; and Cromwell, Notts.*
1866	Fytche, Colonel Albert. *Reform Club, S.W.*
1863	*Gabrielli, Antoine, Esq. 6, *Queen's-gate-terrace, Kensington, W.*
1858	Gaisford, Thomas, Esq. *Travellers' Club, S.W.*
1861	Gallagher, John, Esq., M.D. *Reform Club, S.W.; and* 109, *Westbourne-terrace, W.*
1855	*Galloway, John James, Esq.
1869	790 Galsworthy, Frederick Thomas, Esq. 8, *Queen's-gate, Hyde-park, W.*
1848	*Galton, Capt. Douglas, R.E. 12, *Chester-street, Grosvenor-place, S.W.*
1850	*Galton, Francis, Esq., M.A., F.R.S. 42, *Rutland-gate, S.W.; and* 5, *Bertie-terrace, Leamington.*
1854	*Gammell, Major Andrew. *Drumtochty, Kincardineshire, N.B.*
1861	Garden, Robert Jones, Esq. 30, *Cathcart-road, South Kensington, S.W.*
1869	Gardner, Christopher, T. Esq. 3, *St. James's-terrace, Paddington, W.*
1865	Gardner, Capt., G. H., R.N. 7, *James-street, Westbourne-terrace, W.*
1866	Gardner, John Dunn, Esq. 19, *Park-street, Park-lane, W.*
1863	Gascoigne, Frederic, Esq. *Parlington, Yorkshire.*

Year of Election.	
1859	*Gassiot, John P., Jun., Esq. 6, *Sussex-place, Regent's-park, N.W.*
1866	800 Gastrell, Lieut.-Col. James E. (B. Staff Corps). *Surveyor-General's Office, Calcutta. Care of H. T. Gastrell, Esq.*, 36, *Lincoln's-inn-fields, W.C.*
1866	*Gatty, Charles H., Esq., M.A., *Felbridge-park, East Grinstead, Sussex.*
1865	George, Rev. H. B. *New College, Oxford.*
1859	Gerstenberg, Isidore, Esq. *Stockley-house, North-gate, Regent's-park, N. W.*
1866	*Gibb, George Henderson, Esq., 13, *Victoria-street, Westminster, S.W.*
1865	*Gibbons, Sills John, Esq., Alderman. 13, *Upper Bedford-place, Russell-square, W.C.*
859	*Gibbs, H. Hucks, Esq. *St. Dunstan's, Regent's-park, N.W.*
1855	Gibraltar, Right Rev. and Hon. C. A. Harris, Bishop of. *Gibraltar Palace, Malta.*
1866	Gibson, John, Esq. 2, *Piccadilly, Bradford, Yorkshire; and British Consulate, Hankow, China.*
1855	Gillespie, Alexander, Esq. *Heathfield, Walton-on-Thames, Surrey.*
1866	810*Gillespie, William, Esq. (*of Torbane-hill*). 46, *Melville-street, Edinburgh.*
1857	Gillespy, Thomas, Esq. *Brabant-court, Philpot-lane, E.C.*
1868	*Gillett, Alfred, Esq. 113, *Piccadilly, W.; and Banbury, Oxon.*
1863	*Gillett, William, Esq. 6*L, Albany, W.*
1861	Gilliat, Alfred, Esq. *Exton-house, Bishop's Waltham, Hants.*
1868	Gilliat, Algernon, Esq. *Fernhill, near Windsor; and* 7, *Norfolk-crescent, W.*
1863	Gillies, Robert, Esq., C.E. *Dunedin, Otago, New Zealand.*
1867	Gisborne, Fred. N., Esq., Engineer and Electrician. 445, *West Strand, W.C.*
1836	Gladdish, Col. William. *Bycliffes, Gravesend.*
1864	Gladstone, George, Esq. *Clapham-common, S.*
1863	820 Gladstone, J. H., Esq., Ph.D. 17, *Pembridge-square, W.*
1862	*Gladstone, Robert Stuart, Esq.
1846	*Gladstone, William, Esq. 57½, *Old Broad-street, E.C.*
1864	*Gladstone, W. K., Esq. 39*a, Old Bond-street, W.; and Fitzroy-park, Highgate, N.*
1860	Glascott, Commander Adam Giffard, R.N., Acting Commissioner on the Turko-Persian Frontier. *Messrs. Chard,* 3, *Clifford's Inn, Fleet-street, E.C.*
1867	Glass, H. A., Esq. 4, *Gray's-inn-square, W.C.*
1857	Gleig, Rev. G. R., M.A. *Chaplain-General, Chelsea-hospital, S.W.*
1854	Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. *Oriental Club, W.*
1857	Glover, Commr. John H., R.N. *Lagos; and Army and Navy Club, S.W.*
1866	Glover, Robert Reaveley, Esq. 30, *Great St. Helen's, E.C.*
1868	830 Glyn, Richard H., Esq. 10, *King's-arms-yard, E.C.; and Oriental Club, S.W.*
1864	Glyn, Sir Richard George, Bart. *Army and Navy Club, S.W.*
1862	Goddard, James, Jun., Esq. 14, *Mincing-lane, E.C.*
1869	Goldney, G. Esq., M.P. 40, *Hill-street, Berkeley-square, W.*
1868	Goldsmid, Sir Francis, Bart., M.P. *Inner-circle, Regent's-park, N.W.*

Year of Election.	
1863	Goldsmid, Lt.-Colonel Frederick John. *Harrow-on-the-hill; Southborough, Kent; and United Service Club, S.W.*
1861	Goldsmid, Julian, Esq. 49, *Grosvenor-street, S.W.*
1868	Goldsworthy, Major W. T. *British Service Club, 4, Park-place, St. James's, S.W.*
1860	Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*
1864	Goodall, George, Esq. *Messrs. Cox and Co., Craig's-court; and Junior Carlton Club, W.*
1867	840 *Goodenough, Fred. Addington, Esq. *Care of F. Jennings, Esq., 34, Cannon-street, E.C.*
1863	*Goodenough, Capt. J. G., R.N. *U. S. Club, S.W. Care of Messrs. Stilwell, 22, Arundel-street, Strand, W.C.*
1864	*Goodenough, Lieut.-Col., R.A. *F Battery, 9th Brigade, Royal Artillery, Ahmedabad, Bombay. Care of Messrs. Cox and Co., Craig's-court, S.W.*
1861	Gooldin, Joseph, Esq. 18, *Lancaster-gate, W.*
1865	*Goolden, Charles, Esq. *United University Club, S.W.*
1856	*Gordon, Colonel the Hon. Alexander H., C.B.
1854	Gordon, Harry George, Esq. 1, *Clifton-place, Hyde-park-gardens, W.; and Killiechassi, Dunkeld, Perthshire.*
1856	Gordon, Admiral the Honourable John. 28, *Queen Anne-street, W.*
1853	Gordon, Vice-Admiral Robert. *United Service Club, S.W.*
1866	Gore, Augustus F., Esq., Colonial Secretary. *Barbadoes.*
1853	850 Gore, Richard Thomas, Esq. 6, *Queen-square, Bath.*
1859	Gosling, Fred. Solly, Esq. 18, *New-street, Spring-gardens, S.W.*
1862	Goss, Samuel Day, Esq., M.D. 111, *Kennington-park-road, S.*
1868	Gough, Hugh, Viscount, F.L.S. *Lough Cutra Castle, Gort, Co. Galway.*
1835	Gould, Lieut.-Colonel Francis A. *Buntingford, Herts.*
1846	Gould, John, Esq., F.R.S., F.L.S. 26, *Charlotte-street, Bedford-square, W.C.*
1865	Gowen, Colonel J. E.
1867	Grabham, Michael, Esq., M.D. *Madeira. Care of C. R. Blandy, Esq., 25, Crutched-friars, E.C.*
1868	Graeme, H. M. S., Esq. *Junior Athenæum; and East India U. S. Club, S.W.*
1869	Graham, Andrew, Esq., Staff Surg., R.N. *Army and Navy Club, S.W.*
1868	860 Graham, Cyril C., Esq. 9, *Cleveland-row, St. James's, S.W.; and Debroe-house, Watford, Herts.*
1868	*Graham, Thomas Cuninghame, Esq. *Carlton Club, S.W; and Dunlop-house, Ayrshire.*
1861	Grant, Alexander, Esq. *Oakfield-house, Hornsey, N.*
1861	Grant, Daniel, Esq. 11, *Warwick-road, Upper Clapton, N.*
1865	*Grant, Francis W., Esq. *Army and Navy Club, S.W.*
1860	Grant, Lieut.-Col. James A., C.B., C.S.I. *E. India U. S. Club, S.W.; and 7, Park-square, Regent's-park, N.W.*
1862	Grant, Lieut. J. M. (late 25th Reg.) *Elands Port, Cape of Good Hope. Care of Messrs. Ridgway and Sons, 2, Waterloo-place, S.W.*

Year of Election.	
1860	Grantham, Capt. James, R.E. *Royal Engineers' Office, Sheerness.*
1867	Graves, Rev. John. *Underbarrow Parsonage, Milnthorpe, Westmoreland.*
1830	*Gray, John Edw., Esq., PH. DR., F.R.S., Z.S. and L.S. *British Museu W.C.*
1868	870 Gray, Lieut.-Col. William, M.P. 26, *Prince's-gardens, W.; and Darcy Lec hall, near Bolton.*
1862	Greathed, Lieut.-Colonel Wilberforce, W. H., C.B.
1863	Greaves, Rev. Richard W. 1, *Whitehall-gardens, W.*
1861	Green, Capt. Francis. 89, *Eccleston-square, S.W.*
1869	Green, Sir W. H. R., K.C.S.I., C.B. 36, *St. George's-road, Eccleston-squa S.W.*
1830	Greene, Thomas, Esq. *Whittington-hall, near Burton, Westmoreland.*
1857	*Greenfield, W. B., Esq. 59, *Porchester-terrace, Hyde-park, W.; a Union Club, S.W.*
1865	Greg, W. R., Esq., Comptroller of H.M.S. Stationery Office. *Wimbledon, S.*
1858	*Gregory, Augustus Charles, Esq. *Surveyor-General, Brisbane, Queensla Australia.*
1858	Gregory, Charles Hutton, Esq., C.E. 1, *Delahay-street, Westminster, S.W.*
1860	880*Gregory, Francis Thomas, Esq. *Queensland.*
1858	*Gregory, Isaac, Esq. *Chorlton-hall, Victoria-park, Manchester.*
1857	*Grellet, Henry Robert, Esq.
1865	Grenfell, Henry R., Esq., M.P. 15, *St. James's-place, S.W.*
1858	Grenfell, Pascoe St. Leger, Esq. *Maesteg-house, Swansea.*
1853	Grenfell, Riversdale W., Esq. 27, *Upper Thames-street, E.C.*
1830	*Greswell, Rev. Richard, M.A., F.R.S. 39, *St. Giles, Oxford.*
1866	Grey, Charles, Esq. 13, *Carlton-house-terrace, S.W.*
1837	*Grey, Sir George, K.C.B. *Colonial Office; and Grosvenor-mansions, S.W.*
1864	Grierson, Charles, Esq. *Alexandria. Care of Rev. W. Grierson Smith, Ashk by-Hawick, Scotland.*
1868	890 Griffin, Daniel, Esq. 3, *Crescent-place, Clapham-common, S.*
1862	Griffin, James, Esq. 2, *Eastern-parade, Southsea; and The Hard, Port Hants.*
1861	*Griffith, Daniel Clewin, Esq. 20, *Gower-street, W.C.*
1839	Griffith, John, Esq. 16, *Finsbury-place-south, E.C.*
1863	Griffith, Sir Richard. 20, *Eccleston-square, S.W.*
1836	Griffith, Richard Clewin, Esq. 20, *Gower-street, W.C.*
1867	Griffiths, Captain A. G. F., 63rd Reg. (Major of Brigade, Gibraltar). *Car E. S. Codd, Esq., 35, Craven-street, Strand, W.C.*
1869	Griffiths, William, Esq., J.P. 24, *Great Cumberland-place, W.; and Welkin, Lindfield, Sussex.*
1855	Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. *Townsend-house, Malvern.*
1861	Grosvenor, Lord Richard, M.P. 33, *Upper Grosvenor-street, W.*
1858	900 Grote, George, Esq. 12, *Savile-row, W.*
1857	Gruneisen, Charles Lewis, Esq. 16, *Surrey-street, Strand, W.C.*

Year of Election.		
1861		Gunnell, Commander Edmund H., R.N. _Army and Navy Club, S.W.; 21, Argyll-road, Campden-hill, W._
1859		*Gurney, John H., Esq. _Marldon, Totnes._
1857		Gurney, Samuel, Esq. 20, _Hanover-terrace, Regent's-park, W._
1862		Guthrie, James Alexander, Esq. 30, _Portland-place, W._
1865		Gwyther, John H., Esq. _Meadowcroft, Lower Sydenham, S.E._
1863		Hadfield, Wm., Esq. 11, _Inverness-road, W._
1865		Hadley, Henry, Esq., M.D. _Needwood-lodge, Bay's-hill, Cheltenham._
1863		Hadow, P. D., Esq. _Sudbury-priory, Middlesex._
1865	910	Halcombe, Rev. J. J. _Charter-house, E.C._
1868		Hale, Rev. Edward, M.A. _Eton College; and United University Club, S.W._
1865		Hale, Warren S., Esq., Alderman. 71, _Queen-street, Cheapside, E.C._
1860		Haliday, Lieut.-Colonel William Robert. _United Service Club, S.W._
1853		Halifax, Viscount, G.C.B. 10, _Belgrave-square, S.W.; and Hickleton, Yorkshire._
1853		*Halkett, Rev. Dunbar S. _Little Bookham, Surrey._
1853		*Halkett, Lieut. Peter A., R.N.
1861		Hall, Charles Hall, Esq. _Watergate-house, Emsworth._
1863		Hall, Henry, Esq. 109, _Victoria-street, S.W._
1862		Hall, James Febbutt, Esq. _Fore-street, Limehouse, E._
1863	920	Hall, Thomas F., Esq., F.C.S. 29, _Warwick-square, S.W._
1853		Hall, Admiral Sir William Hutcheson, K.C.B., F.R.S. _United Service Club S.W.; and_ 48, _Phillimore-gardens, Kensington, W._
1865		Hallett, Lieut. Francis C. H., R.H.A. _Junior United Service Club, S.W._
1858		Halloran, Arthur B., Esq. 3, _Albert-terrace, St. Leonard's, Exeter._
1862		Hamilton, Archibald, Esq. _South Barrow, Bromley, Kent, S.E._
1866		Hamilton, Rear-Admiral C. Baillie. 50, _Warwick-square, S.W._
1861		Hamilton, Lord Claude, M.P. 19, _Eaton-square, S.W.; and Barons-court, County Tyrone._
1830		*Hamilton, Capt. Henry G., R.N. 71, _Eccleston-square, S.W._
1869		Hamilton, Capt. Richard Vesey, R.N. 30, _Victoria-road, Charlton, S.E._
1861		Hamilton, Col. Robert William, Grenadier Guards. 18, _Eccleston-square, S.W._
1863	930	Hamilton, R., Esq. _Care of J. Forster Hamilton, Esq.,_ 32, _New Broad-street, E.C._
1830		Hamilton, Terrick, Esq. 121, _Park-street, Grosvenor-square, W._
1846		Hamilton, Rear-Admiral W. A. Baillie. _Macartney-house, Blackheath, S.E._
1853		*Hand, Admiral George S., R.N., C.B. _United Service Club, S.W.; and H.M.S. 'Victory.'_

Year of Election.		
1860		*Handley, Benjamin, Esq. *Chandos-road, Stratford; and Grafton Club, Grafton-street, W.*
1866		Hanham, Commr. T. B., R.N. *Manston-house, near Blandford, Dorset.*
1861		*Hankey, Blake Alexander, Esq.
1857		Hankey, Thomson, Esq. 45, *Portland-place, W.*
1837		*Hanmer, Sir J., Bart., M.P., F.R.S. *Hanmer-hall and Bettisfield-park, Flintshire.*
1859		*Hansard, Henry, Esq. 13, *Great Queen-street, W.C.*
1840	940	*Harcourt, Egerton V., Esq. *Whitwell-hall, York.*
1864		*Hardie, Gavin, Esq. 113, *Piccadilly, W.*
1864		Harding, Captain Charles, F.R.S.L., F.S.S., F.A.S.L. *Grafton Club*, 10, *Grafton-street, Piccadilly, W.*
1864		Harding, J. J., Esq. 1, *Barnsbury-park, Islington, N.*
1864		Hardinge, Capt. E., R.N. 32, *Hyde-park-square, W.*
1861		Hardinge, Henry, Esq., M.D. 18, *Grafton-street, Bond-street, W.*
1862		Hardman, William, Esq., M.A. *Norbiton-hall, Kingston-on-Thames.*
1864		Hardwick, B. Esq. 157, *Fenchurch-street, E.C.*
1868		Harper, J. A. W., Esq. 23, *Grosvenor-road, Pimlico, S.W.; and Lloyd's, E.C.*
1853		Harris, Admiral the Hon. E. A. J., C.B. *H.B.M.'s Envoy Extraordinary and Minister Plenipotentiary, Legation Britannique, Berne. Messrs. Woodhead.*
1869	950	Harris, Lieut. G. F., 20th Regiment. *Care of Colonel Harris*, 28, *Leinster-road, Dublin.*
1859		Harris, Capt. Henry, H.C.S. 35, *Gloucester-terrace, Hyde-park, W.*
1865		Harris, John M., Esq. 12, *Holland-terrace, Holland-road, Kensington, W.*
1863		Harrison, Chas., Esq. *Lawrie-park, Sydenham; and* 3, *Great Tower-st., E.C.*
1865		*Harrison, William, Esq., F.S.A., F.G.S., &c. *Conservative Club, S.W.; Royal Thames Yacht Club*, 7, *Albemarle-street, W.; and Samlesbury-hall, near Preston, Lancashire.*
1838		Harrowby, Dudley, Earl of. *Sandon-ho., Lichfield; and Norton, Gloucestershire.*
1868		*Hart, J. L., Esq. 20, *Pembridge-square, W.*
1854		*Hartland, F. Dixon, Esq., F.S.A., &c. 14, *Chesham-place, S.W.; and the Oaklands, near Cheltenham.*
1863		Harvey, Charles, Esq. *Rathgar-cottage, Streatham, S.*
1865		Harvey, C. H., Esq., M.D. 17, *Whitehall-place, S.W.*
1865	960	Harvey, Edward H. Esq. *Hill-grove house, Bembridge, Isle of Wight; and Carlton Club, S.W.*
1867		Harvey, James, Esq. (Solicitor). *Esk-street, Invercargill, Southland, New Zealand. Care of the Bank of Otago, Old Broad-street, E.C.*
1864		Harvey, John, Esq. *Ickwell Bury, Biggleswade.*
1864		Harvey, John, Esq. 7, *Mincing-lane, E.C.*
1866		Harvey, Richard M., Esq. 15, *Portman-street, W.*
1864		Harvey, W. D., Esq. 52, *Notting-hill-square, S.W.*
1858		Hawker, Edward J., Esq. 37, *Cadogan-place, S.W.*

Year of Election.	
1834	Hawkins, Francis Bisset, Esq., M.D., F.R.S. 29, *Upper Harley-street, W.; and Leweil-lodge, Dorchester.*
1857	Hawkins, Capt. Frank K., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1840	*Hawkins, John, Esq.
1858	970*Hawkins, Col. J. Summerfield, R.E. *Woolwich, S.E.*
1861	Hawksley, Thomas, Esq., C.E. 14, *Phillimore-gardens, Kensington, S.W.*
1860	Haworth, Frederick, Esq.
1852	*Hay, Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., F.R.S. 108, *St. George's-square, S.W.; U. S. Club, S.W.; Dunragit, Glenluce; and Harrow-on-the-hill, N.W.*
1863	*Hay, Lord John, M.P. 15, *Cromwell-road, South Kensington, W.*
1865	Hay, Lord William. 2, *Cleveland-row, S.W.*
1859	Hay, Major W. E. 7, *Westminster-chambers, Victoria-road, S.W.; and Garrick Club, Garrick-street, W.C.*
1868	Haysman, David, Esq. *Portway-house, Weston, Bath.*
1864	Haysman, James, Esq. *Burdett-house, Burdett-road, E.*
1862	Head, Alfred, Esq. 13, *Craven-hill-gardens, Bayswater, W.*
1863	980 Headlam, Right Hon. Thomas E., M.P. 27, *Ashley-place, Victoria-street, S.W.*
1856	Heath, J. Benj., Esq., F.R.S., F.S.A., Consul for Sardinia. 31, *Old Jewry, E.C.*
1863	Heathfield, W. E., Esq. 20, *King-street, St. James's, S.W.*
1861	Hector, Alexander, Esq. 6, *Stanley-gardens, Bayswater, W.*
1861	Hector, James, Esq., M.D. *Care of E. Stanford, Esq.*
1862	Hemans, Geo. Willoughby, Esq., C.E. *Westminster-chambers, Victoria-street, S.W.*
1837	*Henderson, James, Esq. *Littlewood-park, Forbes, Aberdeenshire.*
1853	Henderson, John, Esq. 2, *Arlington-street, Piccadilly, W.*
1866	Henderson, Patrick, Esq. *Care of George Reid, Esq.,* 21, *Abchurch-lane, E.C.*
1864	Henderson, R., Esq. 7, *Mincing-lane, E.C.*
1852	990 Henderson, William, Esq. 5, *Stanhope-street, Hyde-park-gardens, W.*
1844	*Heneage, Edward, Esq. *Stag's-end, Hemel Hempstead.*
1861	Henn, Rev. J., B.A., Head Master of the Manchester Commercial Schools. *Old Trafford, Manchester.*
1860	Hennessey, J. B. N., Esq. *1st Asst. Trig. Survey of India, Dehra in the Dhoon, N.W. Provinces, India. Care of Messrs. H. S. King and Co.*
1838	*Henry, Wm. Chas., Esq., M.D., F.R.S. *Haffield, near Ledbury, Herefordshire.*
1861	*Henty, Douglas, Esq. *Chichester.*
1857	Herd, Captain D. J. 2, *Norway-house, Limehouse, E.*
1858	Hertslet, Edward, Esq. *Librarian, Foreign-office, S.W.; and Belle-vue-house, Richmond, S.W.*
1841	Hessey, James Augustus, Esq. *Manningford Bruce, Pewsey, Wilts.*
1861	Heugh, John, Esq. *Tunbridge-wells.*

Year of Election.	
1840	1000 *Heywood, James, Esq., F.R.S. *Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.*
1860	Heyworth, Capt. Lawrence, 4th Royal Lancashire. *Junior United Service Club, S.W.*
1853	Hickey, Edwin A., Esq. 116, *Piccadilly, W.*
1867	Higgins, Edmund Thomas, Esq., M.R.C.S. 122, *King Henry's-road, Haverstock-hill, N.*
1868	Hiley, Rev. W., M.A. 3, *Cambridge-gardens, Richmond-hill, S.W.*
1856	Hill, Arthur Bowdler, Esq. *South-road, Clapham-park, Surrey, S.*
1867	Hill, O'Dell Travers, Esq. 1, *Landsdowne-villas, Bridge-road-west, Battersea, S.W.*
1854	Hill, Lieut.-Colonel Stephen J., Governor of Antigua. *Army and Navy Club, S.W. Care of Capt. E. Barnett,* R.N., 14, *Woburn-square, W.*
1861	Hilliard, Major George Towers, Madras Staff Corps. 11, *Lansdowne-road, Kensington-park, Notting-hill, W.*
1858	Hinchliff, T. Woodbine, Esq., Barrister-at-Law. 64, *Lincoln's-inn-fields, W.C.*
1862	1010 *Hinde, Samuel Henry, Esq. *Windham Club, S.W.*
1846	*Hindmarsh, Frederick, Esq. 4, *New-inn, Strand, W.C.*
1861	Hoare, Deane John, Esq. *Royal Thames Yacht Club, Albemarle-street, W.*
1868	Hoare, Samuel, Esq., M.A. 1, *Upper Hyde-park-street, W.*
1868	Hobson, Stephen James, Esq. 32, *Nicholas-lane, Lombard-street; and* 10, *Regent's-park-road, N.W.*
1855	Hobbs, Wm. Geo. Ed., Esq. *Beulah-cottage, London-road, Enfield, N.*
1830	*Hobhouse, Henry William, Esq. 24, *Cadogan-place, S.W.*
1869	Hodges, Henry, Esq. *Grammar-school, Cricklewood, near Kilburn.*
1856	*Hodgson, Arthur, Esq., Superintendent of the Australian Agricultural Company.
1861	*Hodgson, James Stewart, Esq. 8, *Bishopsgate-street, E.C.*
1857	1020 Hodgson, Kirkman Daniel, Esq. 8, *Bishopsgate-street, E.C.*
1869	Hodgson, William H., Esq. *Treasury-chambers; and* 1, *Whitehall-gardens, S.W.*
1856	Hogg, James, Esq. 217, *Piccadilly, W.*
1868	Holdich, Thos. Hungerford, Esq., Lt. R.E. 22, *Norland-square, Notting-hill, W.; and* 4, *New-street, Spring-gardens, S.W.*
1865	Hole, Charles, Esq. *Loughborough-house-school, East Brixton, S.*
1839	*Holford, Robert S., Esq. *Dorchester-house, Park-lane, W.*
1867	Holland, Rev. Fred. Whitmore. 6, *Portsea-place, Connaught-square, W.*
1830	Holland, Sir Henry, Bart., M.D., F.R.S. 25, *Lower Brook-street, W.*
1861	Holland, Colonel James. *Southside, The Park, Upper Norwood, S.E.*
1863	Holland, Loton, Esq. 6, *Queen's-villas, Windsor.*
1862	1030 Holland, Robert, Esq. *Stanmore-hall, Great Stanmore, Middlesex.*
1868	Holland, Major T. J., C.B. *Topo. Dept., War-office; The Park, Upper Norwood; East India U.S. Club; and Club of Western India, Poona.*
1861	*Hollingsworth, John, Esq., M.R.C.S. *Maidenstone-house, Greenwich, S.E.*
1861	Holme, J. Wilson, Esq., M.A. *Downswood, Beckenham, Kent, S.E.*
1835	*Holmes, James, Esq. 4, *New Ormond-street, Queen-square, W.C.*

Year of Election.	
1839	*Holroyd, Arthur Todd, Esq., M.D., F.L.S. *Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.*
1857	Holroyd, Henry, Esq. Barrister-at-Law. 2, *Elm-court, Temple, E.C.*
1867	*Holstein, The Marques de Souza. *Lisbon. Care of Messrs. Kraentler and Miceville*, 12, *Angel-Court, E.C.*
1869	Holt, George, Esq. *Union-street, Willenhall.*
1864	Holt, Vesey, Esq. 17, *Whitehall-place, S.W.*
1857	1040 Homfray, William Henry, Esq. 6, *Storey's-gate, S.W.*
1865	Honywood, Robert, Esq. *Manor-house, Wethersfield, Braintree; Windham Club, S.W.*
1864	*Hood, Sir Alex. Acland, Bart. *St. Andrie's-park, Bridgewater, Somerset.*
1862	Hood, Henry Schuback, Esq. *War-office, S.W.; and* 10, *Kensington-park-gardens, W.*
1861	Hood, T. H. Cockburn, Esq. *Stoneridge, Berwickshire.*
1859	*Hood, William Charles, Esq., M.D. *Bethlehem-hospital, S.*
1866	*Hooker, Joseph, Esq., M.D., F.R.S., F.L.S., &c. *Director of the Royal Gardens, Kew.*
1868	Hooper, Alf., Esq. *Fairfield, Upper Sydenham; and* 30, *Moorgate-street, E.C.*
1861	Hopcraft, George, Esq. 3, *Billiter-square, E.C.*
1846	*Hope, Alex. James Beresford, Esq. *Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.*
1862	1050 Hope, Capt. C. Webley, R.N. *H.M.S. 'Brisk,' Australia; Messrs. Hallett & Co.*
1869	Horne, Charles, Esq., H.M. Ind. Civ. Serv. "*Innisfail,*" *Beulah-hill, Upper Norwood.*
1869	Horrex, Theophilus, Esq. 18, *Connaught-square, Hyde-park, W.*
1868	Horton, James Africanus B., Esq., M.D., &c. *Care of Sir John Kirkland*, 17, *Whitehall-place, S.W.*
1861	Hoskins, Capt. A. H., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1859	Hoskyns, Chandos Wren, Esq. *Wraxhall-abbey, Warwickshire.*
1853	Houghton, Lord. 16, *Upper-brook-street, W.; The Hall, Bawtry; and Fryston-hall, Ferrybridge, Yorkshire.*
1856	Hovell, William Hilton, Esq. *Goulburn, New South Wales. Care of Mr. W. Chamberlin*, 74, *Fleet-street, E.C.*
1869	Howard, John, Esq., C.E. *Exmouth, Devon.*
1853	Howard, Sir Ralph, Bart. 17, *Belgrave-sq., S.W.; and Bushy-park, Wicklow.*
1857	1060 Howard, Samuel Lloyd, Esq. *Goldings, Loughton, Essex.*
1864	Howell, W. G., Esq.
1842	*Hubbard, J. Gellibrand, Esq. 24, *Prince's-gate, Hyde-park, S.W.*
1867	*Hubbard, William Egerton, Esq. *St. Leonard's-lodge, Horsham.*
1867	*Hubbard, William Egerton, Esq., Jun., B.A. *St. Leonard's-lodge, Horsham.*
1857	Hughes, Capt. Sir Frederic. *Ely-house, Wexford.*
1838	Hughes, William, Esq. 4, *Lawford-road, Kentish-town, N.W.*
1838	*Hume, Edmund Kent, Esq.
1860	*Hume, Hamilton, Esq. *Cooma Yass, New South Wales. Care of Rev. A. Hume*, 24, *Fitzclarence-street, Liverpool.*

Year of Election.	
1861	Hunt, George S. Lennox, Esq., H.B.M. Consul, *Pernambuco.*
1868	1070 Hunt, John Percival, Esq., M.D. *Great Ouseburn, near York, Yorkshire.*
1866	Hunt, Joseph, Esq. *Cave-house Uxbridge, Middlesex.*
1865	Hunt, Capt. Thomas, R.H.A. *The Barracks, Maidstone.*
1857	Hunt, Zacharias Daniel, Esq. *Aylesbury.*
1868	Hunter, Major Edward. *Junior United Service Club, S.W.*
1862	Hunter, Henry Lannoy, Esq. *Beech-hill, Reading.*
1864	Hutchinson, Capt. R. R. 12, *Furnival's-inn, Holborn, W.C.*
1858	Hutchinson, Thomas J., Esq., F.R.S.L., F.E.S., F.A.S.L., H.B.M. Consul, *Ros* *Argentine Republic. Care of J. B. Alston, Esq., Foreign-office.*
1869	Huxley, Thomas H., Esq., F.R.S., &c. 26, *Abbey-place, St. John's-wood, N*
1860	*Hyde, Captain Samuel. 8, *Billiter-square, E.C.*
1865	1080 Illingworth, Rev. Edward A. 3, *Mecklenburg-street, W.C.*
1852	Illingworth, Richard Stonhewer, Esq. 9, *Norfolk-crescent, Hyde-park, W.*
1850	*Imray, James Frederick, Esq. 102, *Minories, E.; and Beckenham, Kent,*
1867	Ince, Joseph, Esq., F.L.S., &c., &c. 26, *St. George's-place, Hyde-park-corner,*
1861	*Ingall, Samuel, Esq. *Forest-hill, Kent, S.E.*
1860	Ingilby, the Rev. Sir Henry John, Bart. *Ripley-castle, Ripley, Yorkshire.*
1851	Inglefield, Admiral Edward A., C.B., F.R.S. *United Service Club, S.W.;* 10, *Grove-end-road, St. John's-wood, N.W.*
1846	Ingram, Hughes Francis, Esq. *University Club, S.W.*
1869	Inman, Robert Matthew, Esq. *Redbourne, Herts.*
1860	*Inskip, Staff Commander G. H., R.N. *H.M. Surveying Vessel 'Porcupine;'* 6, *Park-place-west, Sunderland.*
1852	1090 *Inskip, Rev. Robert Mills. 8, *Boon's-place, Plymouth.*
1840	*Irby, Frederick W., Esq. *Athenæum Club, S.W.*
1864	*Irving, John, Esq.
1853	Irving, Thomas, Esq.
1861	Irwin, James V. H. 10, *Nottingham-place, Euston-road, N.*
1864	Ives, W. F., Esq., B.A. *St. John's School, Limehouse, E.*
1865	Izard, Frederick, Esq., 70, *New Bond-street, W.*
1866	Jackson, Robert Ward, Esq. 28, *Inverness-road, Hyde-park, W.*
1855	Jackson, William, Esq. 44, *Portland-place, W.*
1862	Jacomb, Thomas, jun., Esq. 23, *Old Broad-street, Gresham-house, E.C.*
1857	1100 James, Colonel Sir Henry, R.E., F.R.S. *Director of the Ordnance Sur* *Southampton.*
1861	James, William Bosville, Esq. 13, *Blomfield-road, Maida-hill, W.*

Year of Election.	
1868	Jamieson, Richard Alexander, Esq., M.A. *St. Luke's, Cork; and care of J. P. Watson, Esq.*, 85, *Gracechurch-street, E.C.*
1868	Jamieson, Hugh, Esq. *Junior Carlton Club, S.W.*
1862	*Jaques, Leonard, Esq. *Wentbridge-house, Pontefract, Yorkshire.*
1863	*Jardine, Andrew, Esq. *Lanrick-castle, Stirling.*
1863	*Jardine, Robert, Esq., M.P. *Castlemilk, Lockerby, N.B.*
1857	Jefferson, Richard, Esq. A4, *The Albany, W.*
1865	Jeffreys, J. G., Esq. 25, *Devonshire-place, W.*
1860	*Jejeebhoy, Sir Jamsetjee, Bart. *Bombay.*
1854	1110 Jellicoe, Charles, Esq. 12, *Cavendish-place, W.*
1859	Jencken, H. Diedrich, Esq. 1, *Brick-court, Temple, E.C.; and* 2, *York-terrace, Upper Sydenham, S.E.*
1854	Jenkins, Capt. Griffith, I.N., C.B. *East India Club, St. James's-square, S.W., and Derwen, Welch Pool, Montgomeryshire.*
1837	*Jenkins, R. Castle, Esq. *Beachley, near Chepstow.*
1854	*Jennings, William, Esq., M.A. 13, *Victoria-street, Westminster, S.W.*
1860	Jermyn, Rowland Formby, Esq. *War-office, S.W.*
1860	Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. *Norwich.*
1864	*Jeula, Henry, Esq. *Lloyd's, E.C.*
1864	*Jeyes, F. F., Esq. *Castle-hill, Ealing, W.*
1847	Johnson, Edmund Chas., Esq. 12, *Wilton-street, Belgrave-square, S.W.*
1859	1120 *Johnson, Henry, Esq. *Messrs. Johnson,* 7, *Bedford-row, Worthing, Sussex.*
1854	Johnson, John Hugh, Esq.
1861	Johnson, William, Esq., R.N. *Junior Carlton Club, S.W.*
1866	Johnson, W. H., Esq., Civil Assistant G. T. S. India. *Dehra Dun, N.W. Provinces, India.*
1843	Johnston, Alex. Keith, Esq., F.R.S.E., Hon. Mem. Berl. Geog. Soc., &c. *March-hall-park; and* 4, *St. Andrew-square, Edinburgh.*
1868	*Johnston, Alexander Keith, Esq., junr. 74, *Strand, W.C.*
1856	Johnston, A. R., Esq., F.R.S. *Heatherley, Sandhurst, near Wokingham, Berks.*
1857	Johnston, J. Brookes, Esq. 29, *Lombard-street, E.C.*
1868	Johnston, Thomas, Esq. 12, *Camden-place, Bath; and King Edward VI. Grammar-school, Bath.*
1866	Johnstone, Colonel H. C. *Murree, Punjab, India. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1867	1130 *Johnstone, John, Esq. *Castlenau-house, Mortlake, S.W.*
1858	Jones, Capt. Edward Monckton, 20th Regt. *Sandhurst, Wokingham, Berks.*
1864	Jones, Captain Felix, late I.N. *Fernside, Church-road, Westow-hill, Upper Norwood, S.*
1868	Jones, Capt. H. M., V.C. *Care of the Foreign-office, S.W.*
1857	Jones, Lt.-Colonel Jenkin, Royal Engineers. 1, *Lennard-place, Circus-road, St. John's-wood, N.W.; and India.*
1862	Jones, John, Esq. 338, *Strand, W.C.*
1861	Jones, John Pryce, Esq. *Grove-park-school, Wrexham.*
1861	Jones, Sir Willoughby, Bart. *Cranmer-hall, Fakenham, Norfolk.*

Year of Election.	
1868	Jones, William S., Esq. 2, *Verulam-buildings, Gray's-inn, W.C.*
1867	*Jordan, Wm. Leighton, Esq. 1, *Powis-square, Notting-hill, W.*
1863	1140 Joshua, Moss, Esq. *Melbourne; and* 22, *Clifton-gardens, Maida-hill, W.*
1868	Kantzow, Capt. H. P. de, R.N. *United Service Club, S.W.*
1858	Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
1865	Kaye, J. W., Esq. *India-office, S.W.*
1860	Keate, R. W., Esq., Lieutenant-Governor, *Trinidad.*
1857	Keating, Sir Henry Singer, Q.C., one of the Judges of the Court of Common Pleas. 11, *Prince's-gardens, S.W.*
1857	Keene, Rev. C. E. Ruck. *Swynscombe-park, Henley-upon-Thames.*
1863	Keir, Simon, Esq. *Conservative Club, S.W.*
1845	*Kellett, Rr.-Adm. Henry, C.B. *Clonmel, Ireland.*
1868	Kellie, Right Hon. the Earl of. 28, *Eaton-place, S.W.; Carlton-Club; and Alloa-park, Scotland.*
1861	1150 Kelly, William, Esq. *Royal Thames Yacht Club,* 7, *Albemarle-street, W.*
1860	*Kemball, Col. Sir Arnold Burrowes, C.B., Indian Army. 2, *Oxford-square, W.; and United Service Club, S.W.*
1863	Kempster, J., Esq. 1, *Portsmouth-place, Kennington-lane, Surrey, S.*
1861	Kennard, Adam Steinmetz, Esq. 7, *Fenchurch-street, E.C.*
1859	Kennard, Coleridge J., Esq. 14, *Lombard-street, E.C.*
1861	Kennard, Robert William, Esq. 37, *Porchester-terrace, Hyde-park, W.*
1861	Kennedy, Edward Shirley, Esq.
1854	Kennedy, Rev. John, M.A. 4, *Stepney-green, E.*
1863	Kerr, J. H., Esq., Staff-Commr. R.N. *Hydrographic-office, S.W.*
1867	Kerr, Robt. M., Esq., (Judge of the City of London Court). 7, *Chester-terrace, Regent's-park, N.W.*
1864	1160 Kerr, Lord Schomberg. 15, *Bruton-street, W.*
1862	Kershaw, Wm., Esq. 16, *St. Mary Axe, E.C.; and Suffolk-lodge, Brixton-road, S.*
1862	Key, J. Binney, Esq. *Oriental Club, W.*
1857	Keysell, Francis P., Esq. *Sycamore-villa,* 35, *Carlton-hill, St. John's-wood, N.W.*
1864	*Kiddle, W. W., Esq. *East Dereham, Norfolk.*
1864	Kimber, Dr. E. *Murchison-house, Dulwich, S.E.*
1846	King, Lieut.-Colonel Edward R., 36th Regt. *Junior United Service Club, S.W.*
1866	King, John, Esq. *Compton-field-place, Guildford, Surrey.*
1861	King, Major W. Ross, Unatt., F.S.A. Scot. *Tertowie, Kinellar, Aberdeenshire; and Army and Navy Club, S.W.*
1868	Kingsley, Henry, Esq. *Wargrave, Henley-on-Thames, Berks; and Garrick Club, W.C.*
1857	1170 *Kinnaird, Hon. Arthur F., M.P. 2, *Pall-mall-east, S.W.*

Year of Election.	
1867	Kinnaird, George William Fox, Lord, K.G. *Rossie-priory, Inchture, N.B.; and* 33, *Grosvenor-street, W.*
1860	Kinns, Samuel, Esq., PH. DR., F.R.A.S. *Highbury-new-park College, N.*
1858	Kirk, John, Esq., M.D. 45, *George-square, Edinburgh.*
1863	Kirke, John, Esq., Barrister. *C. Thorold, Esq., Welham, Retford, Notts.*
1861	Kirkland, Sir John. 17, *Whitehall-place, S.W.; and Foot's-cray-place, Kent, S.E.*
1868	Kisch, Daniel Montagu, Esq. 1, *Devonshire-place, Seven Sisters'-road, Upper Holloway, N.*
1866	*Kitson, James. Jun., Esq. *Hanover-square, Leeds.*
1868	Kitto, Richard L. Middleton, Esq. *Church-hill-villa, Fryerstown, Victoria, Australia.*
1835	*Kjaer, Thomas Andreas, Esq. *Hjornet af Kongins Nyetow og Gathersgaden,* No. 26, *3d Sahl, Copenhagen.*
1867	1180 Knight, Andrew Halley, Esq. 76, *Westbourne-terrace, Hyde-park, W.*
1862	Knollys, Lieut.-General Sir William T., K.C.B., V.-Pres. Council of Military Education. *Eaton-square, S.W.*
1867	Knox, Alex. A., Esq. 91, *Victoria-street, Westminster, S.W.*
1861	Knox, Thomas G., Esq. *India. Care of Messrs. H. S. King and Co.,* 45 *Pall-mall, S.W.*
1866	Kopsch, Henry, Esq. *Custom-house, Shanghai. Care of H. C. Batchelor, Esq.,* 155, *Cannon-street, E.C.*
1861	Kyd, Hayes, Esq., M.R.C.S. *Wadebridge, Cornwall.*
1859	Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. *Mitre-court-chambers, Temple, E.C.; and Club-chambers, S.W.*
1849	*Laffan, Capt. Robert Michael, R.E. *Army and Navy Club, S.W.; and Otham-lodge, Kent.*
1869	Lamb, Hon. Edward William. *Brisbane, Queensland, Australia.*
1859	Lamb, Lieut. Henry, I.N. *H.M. India Store Department, Belvedere-road, Lambeth, S.*
1863	1190 *Lambert, Alan, Esq. *Heath-lodge, Putney-heath, S.W.*
1864	Lambert, Charles, Esq. 2, *Queen-street-place, Upper Thames-street, E.C.*
1868	Lambert, Francis D., Esq. 20, *Devonshire-place, Portland-place, W.*
1867	Lambert, Wm. Blake, Esq., C.E. 3, *Morden-road, Blackheath, S.E.*
1864	Lamert, Capt. G. F. 20, *Albemarle-street, W.*
1861	Lamont, James, Esq. *Knockdow, Greenock, N.B.*
1866	Lampray, John, Esq. 16, *Camden-square, N.W.*
1867	Lamprey, Jones, Esq., M.B., 67th Regt. *Waterford, Ireland.*
1864	Lampson, C. M., Esq. 64, *Queen-street, Cheapside, E.C.*
1838	*Lance, John Henry, Esq., F.L.S. *The Holmwood, Dorking.*

Year of Election.	
1868	1200Lane, Rev. W. W., B.A.
1861	*Lang, Andrew, Esq. *Dunmore, Hunter-river, New South Wales; and Dunmore, Teignmouth, Devon.*
1859	*Lange, Daniel A., Esq. 21, *Regent-street, W.*
1867	Langlands, John, Esq., Engineer. *Melbourne, Australia.*
1865	Langley, Edward, Esq. *Well-hall, Eltham, Kent.*
1856	*Langler, John R., Esq., B.A. *Wesleyan Training College, Westminster; and Gothic-villas,* 2, *Bridge-road-west, Battersea, S.W.*
1833	*Larcom, Maj.-General Sir Thomas Aiskew, R.E., K.C.B., F.R.S. *Castle, Dublin.*
1861	Lardner, Col. John. *United Service Club, S.W.*
1859	Larnach, Donald, Esq. 21, *Kensington-palace-gardens, W.*
1854	Latrobe, Ch. J., Esq. *Clapham-house, Lewes, Sussex.*
1869	1210Laughton, J. K., Esq. *Denton-house, Victoria-road, Southsea; and Royal Naval College, Southampton.*
1846	*Law, Hon. H. Spencer, M.A. 40, *Eaton-place, S.W.*
1861	Lawrence, Edward, Esq. *Beechmont, Aigburth, Liverpool.*
1868	Lawrie, James Esq., 63, *Old Broad-street, E.C.*
1867	Lawson, Wm., Esq. 21, *Walham-grove, Fulham, S.W.*
1862	*Lay, Horatio, N., Esq.
1857	Layard, Right Hon. Austen H., D.C.L. 130, *Piccadilly, W.*
1866	*Layard, Lieutenant Brownlow Villiers (3rd W. India Regt.). 38, *Upper Mount-street, Dublin; and Lane's-hotel,* 1, *St. Alban's-place, S.W.*
1868	Laybourne, Augustine, Esq. 9, *King-street, Finsbury-square, E.C.; and Loughton, Essex.*
1863	*Leaf, Chas. J., Esq. *Old-change, E.C.; and The Rylands, Norwood, S.*
1869	1220*Leaf, F. H., Esq. *Burlington-lodge, Streatham-common, S.W.*
1861	*Learmonth, Dr. John. 11, *Gloucester-gardens, Hyde-park, W.*
1866	Lebour, G. A., Esq. 6, *Addison-crescent, Kensington, W.*
1853	*Le Breton, Francis, Esq. 21, *Sussex-place, Regent's-park, N.W.*
1868	Le Couteur, Lt.-Col. J. Halkett. 17, *Chapel-street, Belgrave-square, S.W.*
1865	Le Feuvre, W. H., Esq., C.E. 9, *Dowgate-hill, Cannon-street, E.C.*
1861	Leckie, Patrick C., Esq. 7, *Palace-road, Roupell-park, Streatham, S.*
1868	Lee, John, Esq. 30, *Berkeley-villas, Loughborough-park, S.*
1868	Lee, Sir Geo. Philip, Bart. 28, *Bryanston-square, W.*
1839	Lee, Thomas, Esq. *Royal Institution, Albemarle-street, W.*
1833	1230*Lefevre, Sir John George Shaw, M.A., D.C.L., F.R.S., Vice-Chancellor of th University of London. 18, *Spring-gardens, S.W.*
1853	Lefroy, General John Henry, R.A., F.R.S. 82, *Queen's-gate, W.*
1862	Leggatt, Clement Davidson, Esq. 43, *Inverness-terrace, W.*
1861	Legh, Wm. John, Esq. 37, *Lowndes-square, S.W.; and Lyme-park, Cheshire.*
1861	*Lehmann, Frederick, Esq. 139, *Westbourne-terrace, W.*
1845	Leigh, John Studdy, Esq., F.G.S. 8, *Old Jewry, E.C.*
1863	Le Mesurier, Henry P., Esq., C.E. *St. Martin's, Guernsey.*

Year of Election.	
1863	Le Messurier, M.-Gen. A. P. 2, *Stanhope-terrace, Hyde-park, W.*
1856	Leslie, the Hon. G. W. 4, *Harley-street, W.*
1867	L'Estrange, Carleton, Esq. *Carlton Club, S.W.*
1840	1240 *Letts, Thomas, Esq. 8, *Royal Exchange, E.C.*
1863	Leveaux, E. H., Esq. 25, *The Cedars, Putney, S.W.*
1857	Leverson, George B. C., Esq. 73, *Gloucester-terrace, Hyde-park, W.*
1869	Leveson, Edward J., Esq. *Newlands, Sydenham, S.E.*
1862	Levick, Joseph, Esq. 8, *Great Winchester-street, Old Broad-street, E.C.*
1866	Levinge-Swift, Richard, Esq. *Levinge-lodge, Richmond, Surrey.*
1859	Levinsohn, Louis, Esq. *Vernon-house, Clarendon-gardens, Maida-hill, W.*
1865	Levy, William Hanks, Esq. *Institution of the Association for the Welfare of the Blind*, 210, *Oxford-street, W.*
1852	Leycester, Captain Edmund M., R.N. 5, *Donegal-terrace, Stoke, Devonport.*
1861	Leyland, Luke Swallow, Esq. *The Leylands, Hatfield, Doncaster.*
1859	1250 Lichfield, Thomas George, Earl of. *Shugborough, Staffordshire.*
1869	Ligar, C. W., Esq., Surveyor General of Victoria. 4, *Royal Exchange-avenue, E.C.; and Melbourne, Australia.*
1856	Lilford, Thomas Lyttleton Powys, Lord. 10, *Grosvenor-place, W.*
1860	Lindsay, H. Hamilton, Esq.
1857	Lindsay, Major-General the Hon. J., Grenadier Guards, M.P. 20, *Portman-square, W.*
1867	*Lindsay, Col. Robert J. L., M.P., V.C. *Lockinge-house, Wantage, Berks; and* 2, *Carlton-gardens, S.W.*
1855	*Lindsay, Wm. S., Esq. *Manor-house, Shepperton, Middlesex.*
1869	Lindsey, Mark John, Esq. 32, *Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.*
1868	Linton, Robert P., Esq., Surg.-Major. 14, *St. James's-square, S.W.*
1858	Lister, John, Esq.
1866	1260 Little, Archibald J., Esq. 34, *Brook-street, Grosvenor-square, W.*
1857	*Lloyd, George A., Esq. *George-yard, Lombard-street, E.C.*
1863	Lloyd, Sir Thomas Davis, Bart. *United University Club, S.W.; and Bronwydd, Carmarthen.*
1864	Lloyd, W., Esq. *Moor-hall, near Sutton Coldfield.*
1867	Lloyd, Rev. Wm. V., M.A. 16, *Lancaster-gate, W.*
1861	Lluellyn, Capt. Richard. 20, *Montagu-square, W.*
1869	Lluellyn, Captain William R., R.A. *Army and Navy Club, S.W.*
1868	Lobley, James L., Esq. 50, *Lansdowne-road, Kensington-park, W.*
1863	Loch, George, Esq. 12, *Albemarle-street, W.*
1859	Loch, Henry Brougham, Esq. *Government-house, Isle of Man.*
1861	1270 Loch, John Charles, Esq. 12, *Albemarle-street, W.; and Hong-Kong.*
1857	Loch, William Adam, Esq. 8, *Great George-street, Westminster, S.W.*
1864	Locke, John, Esq. 83, *Addison-road, Kensington, W.*
1858	Lockhart, William, Esq., F.R.C.S. *Park-villas, Granville-park, Blackheath, S.E.; and China.*

Year of Election	
1860	Lockwood, James Alfred. *United Arts Club, Hanover-square, W.*
1856	*Logan, Sir William Edmond, F.R.S. *Montreal, Canada.*
1860	Londesborough, Wm. Henry Forester, Lord. 3, *Grosvenor-square, W.*
1830	*Long, George, Esq., M.A. 22, *Buckingham-street, Brighton.*
1857	*Long, W. Beeston, Esq.
1858	Longden, Morrell D., Esq. 4, *Ennismore-place, Hyde-park, S.W.*
1865	1280*Longley, Major George, R.E. 60, *Prince's-gate, W.*
1847	Longman, Thos., Esq. *Paternoster-row, E.C.; and* 8, *Sussex-sq., Hyde-park, W.*
1858	Longman, William, Esq. 36, *Hyde-park-square, W.*
1861	Lonsdale, Arthur Pemberton, Esq.
1860	Looker, William Robert, Esq. *Melbourne, Australia. Care of Mr. Ashhurst,* 16, *Bishopsgate-street-within, E.C.*
1856	Lovett, Phillips Cosby, Esq. *Liscombe-ho., Liscombe, Leighton Buzzard, Bucks.*
1867	Low, Alex. F., Esq. 84, *Westbourne-terrace, W.*
1861	Low, Robert, Esq. 17, *Woburn-square, W.C.*
1863	Low, S. P., Esq. 55, *Parliament-street, S.W.*
1858	Lowden, Rev. George Rouse. *Brent-villa, Hanwell, Middlesex.*
1859	1290Lowe, Capt. W. Drury. *Myria, Bettws-y-Coed, Llanrwst, North Wales.*
1863	Lowndes, E. C., Esq. 84, *Eaton-place, S.W.*
1830	Lowry, Joseph Wilson, Esq. 45, *Robert-street, Hampstead-road, N.W.*
1860	Loyd, Col. W. K. *Union Club, S.W.*
1866	Luard, Wm. Charles, Esq. *Llandaff-house, Cardiff; and Athenæum Club, S.W.*
1860	Lumsden, Rev. Robert Comyn, M.A. *Cheadle, Manchester.*
1860	Lush, Robert, Esq., Q.C. *Balmoral-house, Avenue-road, Regent's-park, N.W.*
1866	Lydall, J. H., Esq. 12, *Southampton-buildings, Chancery-lane, W.C.*
1869	Lye, John Gaunt, Esq. 18, *Prince of Wales-terrace, Kensington, W.*
1830	*Lyell, Sir Charles, Bart., M.A., LL.D., F.R.S. 73, *Harley-st., Cavendish-sq., W.*
1837	1300*Lynch, Capt. H. Blosse, I.N., C.B., F.R.A.S. *Athenæum Club, S.W.*
1861	*Lynch, Thomas Kerr, Esq. 31, *Cleveland-square, Hyde-park, W.*
1858	Lyne, Francis, Esq.
1862	*Macarthur, Major-Gen. Sir Edward, K.C.B. 27, *Prince's-gardens, W.*
1863	Macbraire, James, Esq. *Broadmeadows, Berwick-on-Tweed.*
1862	Macdonald, Chessborough C., Esq. 32, *Belsize-park, Hampstead, N.W.*
1843	Macdonnell, Sir Richard Graves, C.B., late Governor of S. Australia.
1865	Macfarlan, John G., Esq. *Clyde-villa, Anerley-hill, Upper Norwood.*
1865	Macfie, Rev. M. *Moseley-road, Birmingham.*
1868	MacGregor, Capt. C. M. *Simla. Care of Messrs. Grindlay.*
1861	1310Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.; and Dunoon, Scotland.*

Year of Election.	
1845	*Macintyre, Patrick, Esq., F.S.A., Off. Assoc. Inst. Act. 1, _Maida-hill, W._
1868	Mackay, Dr. A. E., R.N. _Admiralty, Somerset-house, W.C._
1859	Mackay, Rev. Alexander, LL.D. 1, _Hatton-place, Grange, Edinburgh._
1859	*Mackean, Thos. W. L., Esq. _Bank of British Columbia,_ 5, _East India-avenue._
1845	Mackenzie, Right Hon. Holt, F.R.A.S. _Athenæum Club, S.W.; and_ 28, _Wimpole-street, W._
1860	*Mackenzie, James T., Esq. 69, _Lombard-street, E.C._
1863	Mackenzie, John H., Esq. _Wallington, Carshalton, Surrey._
1864	*Mackeson, Edward, Esq. 59, _Lincoln's-inn-fields, W.C._
1830	Mackillop, James, Esq., F.R.A.S. 30, _Grosvenor-square, W._
1862	1320 Mackinlay, D., Esq. _Oriental Club, W._
1867	Mackinlay, John, Esq., J.P., M.I.C.E., Chief Engineer and Inspector of Machinery, H.M. Dockyard, and Surveyor to the Port, Bombay. _Care of Charles Bannerman, Esq.,_ 193, _Camberwell-new-road, Kennington, S._
1864	Mackinnon, C. D., Esq. _Care of Messrs. J. Clinch and Sons,_ 31, _Abchurch-lane, E.C._
1861	Mackinnon, Lachlan, Esq. _Menabilly, Par-Cornwall; and Reform Club, S.W._
1855	*Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, _Hyde-park-place, W._
1865	*Mackinnon, W., Esq. _Balinakiel-by-Harbert, Argyleshire._
1860	Mackirdy, M.-Gen. Elliot, 69th Rgt. _U. S. Club, S.W.; and Tonghoo, Birmah._
1860	Maclean, William Crighton, Esq., F.G.S. 31, _Camperdown-pl., Great Yarmouth._
1859	MacLeay, George, Esq. 35, _Hyde-park-gardens, W._
1867	Macloughlin, David, Esq., M.D., Member of Legion of Honour, &c. 22, _Maddox-street, W._
1855	1330 Maclure, Andrew, Esq. _Maclure, Macdonald, and Macgregor,_ 37, _Walbrook, E.C._
1861	Maclure, John William, Esq. _Fallowfield, near Manchester._
1860	Macmillan, Alex., Esq. 16, _Bedford-street, Covent-garden, W.C._
1855	Macnab, John, Esq. _Findlater-lodge, Trinity, near Edinburgh._
1868	Macnair, Geo. Esq. _Oriental Club, Hanover-square, W._
1861	Macpherson, William, Esq. 32, _Lancaster-gate, W._
1845	*Macqueen, James, Esq., K.C. Tower and Sword of Portugal. 10, _Honiton-street, Kensington, W._
1865	Mactaggart, Malcolm, Esq. _Sydney, New South Wales._
1863	McArthur, Alex., Esq. _Raleigh-hall, Brixton-rise, Brixton, S._
1867	McArthur, William, Esq. 1, _Guyder-houses, Brixton-rise, S._
1860	1340 McClintock, Capt. Sir Francis Leopold, R.N. _United Service Club, S.W._
1861	*McConnell, W. R., Esq., Barrister-at-Law. 12, _King's-Bench-walk, E.C.; and Charleville, Belfast._
1862	McCosh, John, Esq., M.D. _Junior United Service Club, S.W._
1855	*M'Clure, Admiral Sir Robert J. le M., C.B. _Chipperfield, Herts; and Athenæum Club, S.W._
1865	McDonald, James, Esq. _Oriental Club, Hanover-square, W._
1865	McEuen, D. P., Esq. 24, _Pembridge-square, Bayswater, W._
1865	McEwan, James, Esq. 30, _Holland-park, Kensington, W._
1855	McGregor, Duncan, Esq. _Board of Trade, S.W.; and Athenæum Club, S.W._

Year of Election	
1867	McGregor, Duncan, Esq. *Clyde-place, Glasgow.*
1869	McGrigor, Alexander Bennett, Esq. 19, *Woodside-terrace, Glasgow.*
1866	1350*McIvor, W. G., Esq., *Superintendent of Chinchona Plantations, Ootacamund, Madras.*
1858	McKerrell, Robert, Esq. 45, *Inverness-terrace, W.; and Mauritius.*
1868	McLaren, Robert, Esq. 6, *Räcknitz-platz, Dresden. Care of Messrs. McLaren and Co., 5, South Hanover-street, Glasgow.*
1868	McLean, Frank, Esq., M.A., C.E. 23, *Great George-street, Westminster, S.W.*
1867	McLean, Hon. John. *Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co., 3, Great Winchester-street-buildings, E.C.*
1852	M'Leod, Walter, Esq. *Head Master of the Royal Military Asylum, Chelsea, S.W.*
1866	McNair, Capt. John F. A., R.A.
1839	M'Neil, The Right Hon. Sir John, G.C.B. *Granton, near Edinburgh.*
1859	Maitland, Geo. Gammie, Esq. *Shotover-house, Wheatley, Oxon.*
1845	*Major, Richard Henry, Esq., F.S.A. *British Museum, W.C.*
1868	1360*Makins, Henry F., Esq. 19, *Prince of Wales-terrace, Kensington-palace, W., and Reform Club, S.W.*
1858	Malby, John Walter, Esq. 15, *Richmond-villas, Seven-sisters'-rd., Holloway, N.*
1853	*Malby, Thomas, Esq. 2, *Park-villas, Seven-sisters'-road, Holloway, N.*
1862	*Malcolm, Capt. Edward Donald, R.E. *Chatham.*
1863	Malcolm, Jas., Esq. 22, *Prince's-gate, Knightsbridge, W.*
1843	*Malcolm, W. E., Esq. *Burnfoot, Langholme, near Carlisle.*
1853	*Mallet, Charles, Esq. *Audit-office, W.C.; and 7, Queensborough-terrace, Bayswater, W.*
1860	Mann, James Alexander, Esq., M.R.A.S. *Brecon and Merthyr Tydvil Railway, Brecon.*
1866	Mann, Robert James, Esq., M.D. 1, *Douglas-villas, Surbiton-hill, and* 15, *Buckingham-street, Strand, W.C.*
1866	Manners, Geo., Esq., F.S.A. *Lansdowne-road, Croydon.*
1868	1370Manners-Sutton, Graham, Esq., 7, *Gloucester-terrace, Hyde-park, W.*
1856	Manning, Frederick, Esq. *Byron-lodge, Leamington; and* 8, *Dover-street, W.*
1864	*Mansell, Capt. A. L. *Hydrographic-office, Admiralty, S.W.*
1869	Mantell, Sir John Iles. 3, *Pump-court, Temple, E.C.*
1859	Mantell, Walter Baldock Durant, Esq. *Wellington, New Zealand. Care of E. Stanford, Esq.*
1869	March, Edward Bernard, Esq., H.M. Consul, Fiji Islands. 12, *Buckingham-street, Strand, W.C.*
1860	Mariette, Prof. Alphonse, M.A. 27, *St. Stephen's-square, Bayswater, W.*
1854	Markham, Clements Robert, Esq. *India-office, S.W.; and* 21, *Eccleston sq., S.W.*
1857	Marlborough, George, Duke of. *Blenheim, Woodstock. Care of E. Stanford, Esq.*
1864	Marsden, Rev. Canon J. H. *Higher Broughton, Manchester.*
1857	1380Marsh, Matthew Henry, Esq. *Oxford and Cambridge Club, S.W.; and* 41, *Rutland-gate, S.W.*

Marshall, Capt. J. G. Don. *Downton, Wilts.*

Marshall, James Garth, Esq. *Headingley, near Leeds; and Monk Coniston, Ambleside.*

Marshall, William, Esq. 4, *Paper-buildings, Inner Temple, E.C.*

*Marsham, the Hon. Robert. 5, *Chesterfield-street, Mayfair, W.*

Marshman, J. C., Esq. 7, *Kensington-palace-gardens, W.*

Marthin, Guillermo E. de, Consul-General United States of Columbia. 12, *Orchard-street, Portman-square, W.*

Martin, Francis P. B., Esq.

Martin, Henry, Esq. *Sussex-house, Highbury-new-park, N.*

*Martin, Richard Biddulph, Esq. *Clarewood, Bickley, S.E.*

390 Martin, Thomas, Esq. 5, *Compton-terrace, N.*

Martin, Wm., Esq. 37, *Cleveland-square, Paddington, W.*

Masurvon, Wm. R., Esq.

*Matheson, Sir James, Bart., F.R.S. 13, *Cleveland-row, S.W.; and Achany, Bonar-bridge, Sutherlandshire, &c.*

Mathieson, James Ewing, Esq. 77, *Lombard-street, E.C.; and* 16, *Queen's-gardens, Bayswater, W.*

Maude, Col. Francis Cornwallis, R.A., V.C., &c. *Army and Navy Club, S.W.*

Mavrogordato, M. Lucas. *Belgrave-mansions, Grosvenor-gardens, S.W.; and Messrs. Ralli, Brothers,* 25, *Finsbury-circus, E.C.*

*Maxwell, Sir William Stirling, Bart. 128, *Park-street, Grosvenor-square, W.*

May, Daniel John, Esq., R.N., Staff-Commr. *Care of Case and Loudensack.*

Mayer, Joseph, Esq., F.S.A. 68, *Lord-street, Liverpool.*

400 Mayers, William S. F., Esq., Interpreter to H.M. Consulate. *Shanghai. Care of F. J. Angier, Esq.,* 12, *George-yard, Lombard-street, E.C.*

Mayhew, Rev. Samuel Martin. 158, *New Kent-road, S.*

Mayne, Captain Richard Charles, R.N., C.B. 80, *Chester-square, S.W.*

Mayo, Capt. John Pole. *Army and Navy Club, S.W.*

Mayson, John S., Esq. (J. P. for county of Lancashire). *Oakhill, Fallowfield, near Manchester.*

Meade, the Hon. Robert Henry. *Foreign-office, S.W.; and* 3, *Belgrave-square, S.W.*

*Medlycott, Lieut. Mervyn B., R.N. *Care of Messrs. Woodhead.*

Melvill, Col. Sir Peter Melvill, Mil. Sec. to the Bombay Gov. 27, *Palmeira-square, Brighton.*

Melvill, Philip, Esq., F.R.A.S. *Ethy-house, Lostwithiel, Cornwall.*

Merewether, Col. William Lockyer, C.B. *Kurrachee.*

410 Mercier, Rev. J. J. *Hanwell, W.*

*Merivale, Herman, Esq., C.B., Under Sec. of State for India. *India-office, S.W.; and* 26, *Westbourne-terrace, W.*

Messiter, Charles A., Esq. *Barwick, near Yeovil, Somerset.*

Metcalfe, Frederic Morehouse, Esq. *Wisbech, Cambridgeshire.*

Year of Election.	
1837	*Mexborough, John Chas. Geo. Earl of. 33, *Dover-street, W.; and Methley-park, near Leeds.*
1865	*Michell, Lieut.-Colonel J. E., R.H.A.
1868	Michell, Robert, Esq. 17, *King-street, St. James's, S.W.*
1863	*Michie, A., Esq. 26, *Austin-friars, E.C.*
1848	Middleton, Rear-Admiral Sir G.N. Broke, Bart., *H.M.S. 'Hero,' Sheerness; and Broke-hall, Suffolk.*
1868	*Miers, Jno. William, Esq., C.E. 74, *Addison-road, Kensington, W.*
1859	1420 Miland, John, Esq. *Clairville, Lansdown-road, Wimbledon.*
1866	Mildmay, Capt. Herbert St. John (Rifle Brigade). 19, *Charles-street, Berkeley-square, W.*
1860	Miles, Rev. R. *Bingham, Notts.*
1861	*Miller, Commander Henry Matthew, R.N. *The Grove, Exeter; and Junior United Service Club, S.W.*
1868	Miller, Robert Montgomerie, Esq. *Culverden-grove, Tunbridge-wells.*
1853	*Miller, Capt. Thomas, R.N. *H.M.S. 'Royal George;' and United Service Club, S.W.*
1861	Milligan, Joseph, Esq. 15, *Northumberland-street, W.C.*
1857	Mills, Arthur, Esq. 34, *Hyde-park-gardens, W.*
1863	*Mills, John R., Esq. *Kingswood-lodge, Tunbridge-wells.*
1864	Mills, Rev. John. 40, *Lonsdale-square, N.*
1863	1430 *Milton, Viscount, M.P. 34, *Curzon-street, W.*
1860	Milman, Capt. Everard, Royal Horse Artillery. 5, *Waterden-crescent, Stoke, Guildford.*
1866	Milne, Vice-Admiral Sir Alex., K.C.B. *United Service Club, S.W.*
1867	Milner, Rev. John, B.A. *Chaplain of H.M.S. 'Galatea.'*
1860	Mitchell, Capt. Alexander. 6, *Great Stanhope-street, Park-lane, W.*
1862	*Mitchell, George, Esq. 22, *Bolton-street, Piccadilly, W.*
1864	Mitchell, Thomas, Esq., C.E. *Oldham.*
1859	Mitchell, Sir William. 6, *Hyde-park-gate, Kensington-gore, W.*
1865	Mitchell, Wm. H., Esq. *Junior Carlton Club, S.W.*
1851	*Mocatta, Frederick D., Esq. 35, *Gloucester-place, Portman-square, W.*
1853	1440 Moffatt, George, Esq. 103, *Eaton-square, S.W.*
1868	Moffitt, John, Esq. 5, *Canning-place, South Kensington, W.*
1861	Mollison, Alexander Fullerton, Esq. *Woodcote, Tunbridge-wells.*
1842	*Montagu, Major Willoughby. *Clapham-common, S.*
1862	*Montague, Capt. Horace. 24, *Chapel-street, Park-lane, W.*
1830	*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, *Grosvenor-gate, Park-lane, W.; and East-cliff-lodge, Ramsgate.*
1859	Montgomerie, Capt. T. G., Engrs., 1st Assist. Trig. Survey. *Care of Messrs. Alexander Fletcher & Co.*, 10, *King's-arms-yard, Moorgate-street, E.C.*
1865	Montgomery, Sir Robert, K.C.B. 7, *Cornwall-gardens, Queen's-gate, W.*
1839	Moody, General R. C., R.E. *Caynham-house, near Ludlow, Shropshire.*

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857 *Moor, Rev. Allen P., M.A., F.R.A.S. *Sub-Warden St. Augustine College, Canterbury.*

863 1450 Moore, H. Byron, Esq. *Survey Office, Melbourne, Australia. Care of Mr. Wadeson,* 100, *St. Martin's-lane.*

861 Moore, John Carrick, Esq. *Corswall, Wigtonshire; Geological Society, W.C.; and* 23, *Bolton-street, W.*

857 Moore, Major-General W. Y. *United Service Club, S.W.*

863 More, R. Jasper, Esq. *Linley-hall, Salop.*

869 *Morgan, Delmar, Esq. 5, *Kensington-gardens-square, W.*

864 Morgan, D. L., Esq. *H.M.S. 'Euryalus.'*

861 Morgan, Junius Spencer, Esq. 13, *Prince's-gate, Hyde-park, S.W.*

861 Morgan, William, Esq., R.N. 1, *Sussex-place, Southsea, Hants.*

866 Morland, Lieut. Henry, late I.N. *Assistant Dockmaster, &c., Bombay.*

839 *Morris, Charles, Esq. *University Club, S.W.*

868 1460 Morris, Eugene, Esq. *Birchwood, Sydenham, Kent.*

863 Morrison, Col. J. D. 7, *Albemarle-street, W.*

868 Morrison, Martin C., Esq. 134, *Shooter's-hill-road, Blackheath.*

867 Morrison, Pearson, Esq. *Anglo-Italian Mining Co.,* 52, *Moorgate-street, E.C.;*

865 Morson, T., Esq. 124, *Southampton-row, Russell-square, W.C.*

869 Moser, Robert James, Esq. 45, *Bedford-square, W.C.*

869 Mott, F. T., Esq. 1, *De Montfort-street, Leicester.*

861 *Mouat, Frederick J., Esq., M.D., Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c. *Athenæum Club, S.W.; and* 45, *Arundel-gardens, Notting-hill, W. Care of Messrs. A. C. Lepage & Co.,* 1, *Whitefriars-street, Fleet-street, E.C.*

868 *Mounsey, Aug. Henry, Esq. *British Legation, Florence. Care of F. B. Alston, Esq., Foreign-office, S.W.*

858 Mudie, Charles Edward, Esq.

858 1470 Mueller, Ferdinand, Esq., M.D., PH. DR. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dulau and Co.,* 37, *Soho-square, W.*

862 Muir, Francis, Esq., LL.D.

855 Muir, Thomas, Esq. 24, *York-terrace, Regent's-park, N.W.*

867 *Muir, Thomas, Esq., Jun. *Madeira; and* 24, *York-terrace, Regent's-park, N.W.*

869 Müller, Albert, Esq. *Eaton-cottage, South Norwood, S.*

866 Mundella, A. J., Esq. *Nottingham.*

869 Munton, Francis Kerridge, Esq. 21, *Montagu-street, Russell-square, W.C.*

866 *Murchison, John H., Esq. *Surbiton-hill, Kingston-on-Thames; and Junior Carlton Club, S.W.*

859 Murchison, Kenneth R., Esq. *Manor-house, Bathford, Bath.*

830 *Murchison, Sir Roderick Impey, Bt., K.C.B., G.C.ST.A., M.A., D.C.L., V.P.R.S., G.S., and L.S., Grand Officer of the Order of the Crown of Italy, Director-General of the Geological Survey of Great Britain and Ireland, Trust. Brit. Mus., Hon. Mem. R.S. of Ed., R.I.A., Foreign Mem. of the Academy of Sciences, Paris, Mem. Acad. St. Petersburg, Berlin, Stockholm, Brussels, and Copenhagen, Corr. Ins. Fr., *etc. etc.* 16, *Belgrave-square, S.W.; and* 28, *Jermyn-street, S.W.*

Year of Election.	
1864	1480 Murchison, Capt. R. M. 120, *Ebury-street, Pimlico, S.W.*
1830	*Murdock, Thomas W. C., Esq. 8, *Park-street, Westminster, S.W.; River-bank, Putney, S.W.*
1860	Murray, George J., Esq. *Purbrook-house, Cosham, Hants; and Junior Car Club, S.W.*
1868	*Murray, Henry, Esq. *Hong Kong. Care of Messrs. Jardine, Matheson, Co., 3, Lombard-street, E.C.*
1844	*Murray, James, Esq. *Foreign-office, S.W.*
1830	Murray, John, Esq. 50, *Albemarle-street, W.; and Newstead, Wimbledon, S.*
1860	*Murray, Lt. W., 68th Beng. N. Inf., Topo. Assist. G. Trig. Survey. *Musso India. Messrs. H. S. King and Co.*
1865	Mussy, H. G. de, Esq., M.D. 4, *Cavendish-place, W.*
1865	Nairne, P. A., Esq. 2, *Grove-hill, Camberwell, S.*
1853	Napier, Maj.-General Geo. Thomas Conolly, C.B. *Jun. United Service Club, S. Care of Sir J. Kirkland.*
1868	1490 Napier, of Magdala, Lord, G.C.B., F.R.S. 49, *Cleveland-square, S.W.*
1861	Napier, William, Esq.
1859	*Nasmyth, Capt. David J., 1st Assist. Trigonometrical Survey. *Bhooj, Bom and* 5, *Charlotte-street, Edinburgh.*
1857	*Nesbitt, Henry, Esq. 12, *Victoria-villas, Kilburn, N.W.*
1869	Neville, Lieut.-Col. Edward. 30, *Clarges-street, Piccadilly, W.*
1868	Newbatt, Benjamin, Esq., F.S.S., &c. 7, *Vicarage-gardens, Campden-hill,*
1867	Newdigate, Lieut.-Col. Francis W. (Coldstream Guards). *Byrkley-lodge, wood Forest, Burton-upon-Trent.*
1856	Newman, Thomas Holdsworth, Esq. 43, *Green-street, Grosvenor-square,*
1868	Nicol, Geo. William, Esq. *Care of Messrs. Glyn, Mills, and Co.,* 67, *Lom street, E.C.*
1866	Nicol, James D., Esq., M.P. 13, *Hyde-park-terrace, Cumberland-gate, W.*
1869	1500 Nicol, Robert Esq. *Reform Club, S.W.; and Westminster-palace-hotel, S.*
1868	Nicol, William, Esq. 41, *Victoria-street, S.W.; and Fawsyde, Kenneff, cardine.*
1865	*Nichols, Robert C., Esq. 5, *Sussex-place, W.*
1856	Nicholson, Sir Charles, Bart., D.C.L., Chancellor of the University, Sydney. *Devonshire-place, Portland-place, W.*
1836	Nicolson, Rear-Admiral Sir Frederick Wm. Erskine, Bart. 15, *William- Lowndes-square, S.W.*
1864	Nissen, H. A., Esq. *Mark-lane, E.C.*
1858	Nix, John H., Esq. 77, *Lombard-street, E.C.*
1861	Noel, the Hon. Roden. 11, *Chandos-street, Cavendish-square, W.; Exton-hall, Oakham, Rutlandshire.*

Year of Election.

1857 *Nolloth, Captain Matthew S., R.N. 13, *North-terrace, Camberwell, S.E.; and United Service Club, S.W.*
1865 Norman, H. J., Esq. 106, *Fenchurch-street, E.C.*
1860 1510 Norris, Harry, Esq. *Colonial-office, S.W.; and* 4, *Little St. James's-street, S.W.*
1861 North, Alfred, Esq. 20, *Royal York-crescent, Clifton, Bristol.*
1865 Northumberland, Algernon George, Duke of. *Northumberland-house, S.W.*
1862 Notman, Henry Wilkes, Esq. 7, *Great Marlborough-street, W.*
1862 Nourse, Henry, Esq. *Conservative Club, S.W.*

1858 *Oakeley, R. Banner, Esq. *Kilmaronaig, Inverary, Argyllshire, N.B.*
1867 O'Brien, James, Esq. 109, *Belgrave-road, Pimlico, S.W.; and Clare, Ireland.*
1856 O'Connor, Major-General Luke Smyth, C.B., late Governor of the Gambia. *U.S. Club, S.W.*
1858 Ogilvie, Edward D., Esq. *Yulgillar, Clarence-river, New South Wales. Care of Messrs. Marryat and Sons, Laurence Pountney-lane, E.C.*
1863 Ogilvy, Col. Thos. 23, *Grafton-street, Piccadilly, W; and Ruthven, Forfarshire, N.B.*
1864 1520 Ogilvy, Thos., Esq. 62, *Prince's-gate, Hyde-park, W.*
1861 Oldershaw, Capt. Robert Piggott. 74, *Warwick-square, Belgrave-road, S.W.*
1855 Oliphant, Laurence, Esq. *Athenæum Club, S.W.*
1866 Oliver, Lieut. S. P., 12th Brigade R.A. 1, *Buckingham-villas, Brockhurst-road, Gosport, Hants.*
1845 *Ommanney, Adml. Erasmus, C.B., F.R.A.S. 6, *Talbot-square, Hyde-park, W.; and United Service Club, S.W.*
1838 *Ommanney, H. M., Esq. *Blackheath, S.E.*
1867 Ormathwaite, John Benn-Walsh, Lord. 28, *Berkeley-square, W.*
1853 Osborn, Sir George R., Bart. *Travellers' Club, S.W.; and Chicksand-priory, Beds.*
1856 Osborn, Capt. Sherard, R.N., C.B., Officier de Légion d'Honneur, etc. *Athenæum Club, S.W.; and* 119, *Gloucester-terrace, W.*
1861 Osborne, Lieut.-Col. Willoughby. *Political Agent, Bhopal, Schira, India.*
1869 1530 O'Shaughnessy, Richard, Esq. 12, *Cornwall-gardens, South Kensington, W.*
1852 Oswell, William Cotton, Esq.
1855 Otway, Arthur John, Esq., M.P. *Army and Navy Club, S.W.*
1860 *Ouvry-North, the Rev. J. *East Acton, Middlesex, W.*
1844 *Overstone, Samuel, Lord, M.A., M.R.I. 2, *Carlton-gardens, S.W.; and Wickham-park, Surrey.*
1868 Owden, Thomas S. Esq. *Mount-pleasant, Philip-lane, Tottenham.*
1867 Owen, Capt. Chas. Lanyon (Adj. R. M. Light Inf., Portsmouth Division). *Glendowan-lodge, Bury-road, Gosport.*

Year of Election.	
1861	Page, Thomas, Esq., C.E., F.G.S. 3, *Adelphi-terrace, W.C.; and Tower Cressy, Aubrey-road, Bayswater, W.*
1853	Pakington, Right Hon. Sir John Somerset, Bart., M.P. 41, *Eaton-square, S. W.; and Westwood-park, Droitwich, Worcestershire.*
1868	Paliologus, William Thomas, Esq. *Care of Messrs. McGregor and Co.,* 17, *Charles-street, S. W.*
1855	1540 Palmer, Major Edm., R.A. *Boxhill, Pennycross, Plymouth.*
1865	*Palmer, Commander George, R.N. *H.M.S. 'Rosario,' Australia; and Cavers, Hawick, Roxburgshire, N.B.*
1862	Palmer, Rev. Jordan, M.A., F.S.A., Chaplain to St. Ann's Royal Society. *Streatham, S.*
1838	*Palmer, Samuel, Esq.
1865	*Papengouth, Oswald C., Esq., C.E. 46, *Russell-square, W.C.*
1863	*Paris, H.R.H. Le Comte de. *Claremont.*
1864	Parish, Capt. A. *Chislehurst, Kent.*
1849	*Parish, Capt. John E., R.N. *Army and Navy Club, S. W. Care of Messrs. Stilwell.*
1833	*Parish, Sir Woodbine, K.C.H., F.R.S., &c. *Quarry-house, St. Leonard's-on-Sea.*
1866	Parker, Capt. Francis G. S., F.G.S., A.I.C.E. *Barracks, Belfast.*
1862	1550 Parker, Robert Deane, Esq. *Union Club, S.W.; and Barham, Canterbury.*
1850	Parkes, Sir Harry S., C.B., &c. *Oriental Club, W.; and Athenæum Club, S.W.*
1850	*Parkyns, Mansfield, Esq., F.Z.S. *Arthur's Club, St. James's-street, S. W.; and Woodborough-hall, Southwell.*
1859	Pasteur, Marc Henry, Esq. 38, *Mincing-lane, E.C.*
1867	Paterson, John, Esq. 19A *Coleman-street, City, E.C.*
1857	Paton, Andrew A., Esq. *H.B.M.'s Vice-Consul, Missolonghi, Greece.*
1863	Pattinson, J., Esq. 21, *Bread-street, E.C.*
1868	Paul, J. H., Esq., M.D. *Camberwell-house, Camberwell, S.*
1858	Paul, Joseph, Esq. *Ormonde-house, Ryde, Isle of Wight.*
1865	Payne, Captain J. Bertrand, M.R.I., F.R.S.L., Mem. Geograph. Soc. of France. *Conservative Club, S.W.; Royal Thames Yacht Club, W.; and Tempsford-house, The Grange, Brompton, W.*
1847	1560 *Paynter, William, Esq., F.R.A.S. 21, *Belgrave-square, S.W.; and Camborne-house, Richmond, Surrey, S.W.*
1853	Peacock, George, Esq. *Starcross, near Exeter.*
1863	Pearse, Capt. R. B., R.N. *Arthur's Club. Care of Messrs. Woodhead.*
1863	Pearson, Fred., Esq. 13, *Cleveland-square, W.*
1853	*Peckover, Alexander, Esq. *Wisbeach.*
1860	*Peek, Henry William, Esq., M.P. *Wimbledon-house, S.W.*
1861	Peel, Archibald, Esq. *The Gerwyn, Wrexham, N. Wales.*
1858	Peel, Sir Robert, Bart., M.P. 4, *Whitehall-gardens, S.W.; and Drayton-manor, Tamworth.*
1868	*Pender, John, Esq. 18, *Arlington-street, W.*
1863	*Pennant, Col. S. S. Douglas. *Penrhyn-castle, Bangor, N.B.*
1859	1570 *Penrhyn, Lord. *Penrhyn-castle, Bangor.*
1853	Percy, Major-General the Hon. Lord Henry M. (Guards). 40, *Eaton-square, S.W.*

Year of Election.	
1865	Pereira, Francisco E., Esq. *Care of Messrs. Richardson*, 13, *Pall-mall.*
1860	Perkins, Frederick, Esq. *Mayor of Southampton.*
1865	Perkins, William, Esq. *Rosario, Argentine Republic. Care of W. Bollaert, Esq.*
1859	Perry, Sir Erskine, Member Indian Council. 36, *Eaton-place, S. W.*
1865	Perry, Gerald R. Esq., British Consulate, Stockholm. *Care of E. Hertslet, Esq., Foreign-office, S. W.*
1859	Perry, William, Esq., H.B.M.'s Consul, Panama. *Athenæum Club, S. W.*
1862	*Perry, William, Esq. 9, *Warwick-road, Upper Clapton, N.E.*
1862	Peter, John, Esq.
1857	1580*Peters, William, Esq. 35, *Nicholas-lane, Lombard-street, E.C.*
1860	*Petherick, John, Esq. *Henley-on-Thames.*
1858	Peto, Sir S. Morton, Bart. 12, *Kensington-palace-gardens, W.*
1861	Petrie, Alexander S., Esq. 4, *St. Mark's-square, N. W.*
1860	Petrie, Major Martin, 97th Regiment. *Hanover-lodge, Kensington-park, W.*
1866	Pharazyn, Robert, Esq. *Wellington, New Zealand. Care of Messrs. Scales and Rogers*, 24, *Mark-lane, E.C.*
1867	Phayre, Col. Sir Arthur. *East India United Service Club, S. W.*
1854	Phelps, William, Esq. 18, *Montagu-place, Russell-square, W.C.*
1862	Phené, John Samuel, Esq., F.G.S. 5, *Carlton-terrace, Oakley-street, S. W.*
1860	Philip, George, Esq. 32, *Fleet-street, E.C.*
1865	1590Philipps, Edward B., Esq. 105, *Onslow-square, S. W.*
1857	Phillimore, Capt. Augustus, R.N. 25, *Upper Berkeley-st., W.; and U.S. Club, S. W.*
1859	Phillimore, Chas. Bagot, Esq. *India-office, S. W.; and* 25, *Upper Berkeley-st., W.*
1860	Phillimore, Wm. Brough, Esq., late Capt. Grenadier Guards. 5, *John-street, Berkeley-square, W.*
1854	Phillips, Major-General Sir B. Travell. *United Service Club, S. W.*
1869	Phillips, Edward Augustus, Esq. 19, *Elgin-road, Maida-vale, W.*
1830	*Phillipps, Sir Thomas, Bart., M.A., F.R.S., F.S.A. *Middle-hill, Broadway, Worcestershire.*
1856	Phillips, John, Esq., Solicitor. *Hastings.*
1867	Pierce, Charles A., Esq. *South Kensington Museum, W.*
1869	Piggot, John, jun., Esq., F.S.A., &c. *The Elms, Ulting, Maldon, Essex.*
1864	1600*Pigou, F. A. P., Esq. *Dartford, Kent.*
1865	Pigou, Rev. F., M.A. 14, *Suffolk-street, Pall-mall-east, S. W.*
1861	Pike, Frederick, Esq. 44, *Charing-cross, S. W.*
1852	*Pike, Captain John W., R.N. *United Service Club, S. W.*
1855	Pilkington, James, Esq. *Blackburn.*
1865	Pilkington, William, Esq. *War-office.*
1852	*Pim, Capt. Bedford C. T., R.N. *Belsize-square, Hampstead, N. W.; and Senior and Junior United Service Club, S. W.*
1858	Pincott, James, Esq. *Telham-house-school, Brixton-hill, S.*
1859	Pinney, Colonel William. 30, *Berkeley-square, W.*

Year of Election.	
1867	Plant, Nathaniel, Esq. *Hotel Exchange, Rio de Janeiro; and De Mont house, Leicester.*
1865	1610 Player, John, Esq. 24, *Duchess-road, Edgbaston, Birmingham.*
1860	Playfair, Lieut.-Col. Robert Lambert. H.B.M. Consul-General, Algiers. *of E. Hertslet, Esq., Foreign-office.*
1866	Plowden, Charles, C., Esq. *Belgrave-mansions, Grosvenor-gardens, S.W.*
1856	*Plowes, John Henry, Esq. 39, *York-terrace, Regent's-park, N.W.*
1855	*Pollexfen, Capt. J. J. *India.*
1866	*Pollington, Jno. Horace, Viscount. 33, *Dover-street, W.*
1853	Pollock, General Sir George, G.C.B. *Clapham-common, Surrey, S.*
1835	*Ponsonby, Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square, W.*
1860	Pook, Captain John. 6, *Colfe's-villas, Lewisham-hill, S.E.*
1857	Pope, Captain Wm. Agnew. 12, *Stanhope-place, Hyde-park, W.*
1863	1620 *Porcher, Captain Edwin A., R.N. 3, *Montagu-square, W.*
1853	Porter, Edwd., Esq. *Athenæum Club, S.W.; and* 26, *Suffolk-street, P mall, S.W.*
1864	Portugal, Chev. Joaquim de.
1868	Potter, Archibald Gilchrist, Esq. *Woodham-lodge, Lavender-hill, Wandswo S.W.*
1867	Potter, Wm. Henry, Esq. *Dunsden-lodge, Sowning, near Reading.*
1861	*Pounden, Captain Lonsdale. *Junior United Service Club, S.W.; and Brow wood, Co. Wexford.*
1862	Povah, Rev. John V., M.A. 11, *Endsleigh-street, W.C.*
1864	*Powell, F. S., Esq. 1, *Cambridge-square, Hyde-park, W.*
1859	Power, E. Rawdon, Esq. Retired List, Ceylon Civil Service. *Heywo lodge, Tenby, South Wales; and Thatched House Club, S.W.*
1854	Power, John, Esq. 3, *College-terrace, Cambridge-road, Hammersmith, W.*
1854	1630 Power, John Arthur, Esq., M.A., B.M. 52, *Burton-crescent, W.C.*
1868	Pownall, John Fisher, Esq. 63, *Russell-square, W.C.*
1864	Powys, the Hon. C. J. F.
1864	Powys, the Hon. E. R.
1864	Powys, Hon. Leopold. 17, *Montagu-street, Portman-square, W.*
1868	Price, Charles S., Esq. *Bryn Derwen, Neath.*
1869	Price, F. G. H., Esq. 12, *Upper Berkeley-street, Portman-square, W.*
1852	Price, James Glenie, Esq., Barrister-at-Law. 14, *Clement's-inn, W.C.*
1869	Prichard, Iltudus Thomas, Esq. 29, *Granville-park, Blackheath, S.E.*
1860	*Prickett, Rev. Thomas William, M.A., F.S.A.
1868	1640 Prideaux, W., F. Esq., Bombay Staff Corps. 13, *Avenue-road, Regent's-pk., N.*
1865	*Pringle, A. Esq. *Yair, Selkirk, N.B.*
1855	*Pringle, Thomas Young, Esq. *Reform Club, S.W.*
1866	*Prinsep, Edw. Aug., Esq., B.C.S., Commissioner of Settlements in the Pun *Umritsur. Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C.*
1868	Pritchard, Lieut.-Col. Gordon Douglas. *Chatham.*

Year of Election.	
1868	Pryce, James E. Coulthurst, Esq. *Conservator of the Port of Bombay.*
1861	*Prodgers, Rev. Edwin. *The Rectory, Ayott St. Peter's, Herts.*
1852	Prout, John William, Esq., M.A., Barrister-at-Law. *Athenæum Club, S.W.; and Neasdon, Middlesex, N.W.*
1862	*Puget, Major J., 8th Hussars. *Dundalk, Ireland.*
1860	Puller, Arthur Giles, Esq. *Athenæum Club, S.W.; Arthur's Club, S.W.; and Youngsbury, Ware.*
1857	1650 Purcell, Edward, Esq., LL.D. 2, *Maze-hill, Greenwich, S.E.*
1869	Purdon, Lieut. George Frederic, R.N. *Woodlands, Bracknell, Berks.*
1865	*Pusey, Sidney E. Bouverie, Esq. 7, *Green-street, Grosvenor-square, W.*
1867	Quin, Francis Beaufort Wyndham, Esq. *Wistanswick-house, near Market Drayton, Salop.*
1861	Quin, Lord George. 15, *Belgrave-square, S.W.*
1862	Quin, John Thos., Esq. *Care of Mr. Lambson, Epsom.*
1854	*Quin, Admiral Michael. *Senior United Service Club, S.W.;* and 18, *Albion-villas, Albion-road, Islington, N.*
1868	Quin, T. Francis, Esq. 9, *Grafton-square, Clapham, S.*
1858	*Radstock, Graville Augustus, Lord. 30, *Bryanston-square, W.*
1869	Rae, Edward, Esq. *Claughton, near Birkenhead.*
1862	1660*Rae, James, Esq. 32, *Phillimore-gardens, Kensington, W.*
1853	Rae, John, Esq., M.D. 2, *Addison-gardens-south, Holland-villas-road, Kensington, W.*
1867	Raleigh, Rev. A., D.D. *Arran-house, Highbury-new-park.*
1866	Ramsay, Alex., Jun., Esq. 45, *Norland-square, Notting-hill, W.*
1866	*Ramsay, Admiral G. *United Service Club, S.W.*
1867	Ramsay, John, Esq. *Islay, N.B.*
1851	*Ramsay, Rear-Admiral Wm., C.B., F.R.A.S. *Junior United Service Club, S.W.; and* 23, *Ainslie-place, Edinburgh.*
1867	*Ramsden, Richard, Esq., B.A. *Camp-hill, Nuneaton, Warwickshire.*
1869	Randell, Thomas, Esq. *St. Mark's College, Chelsea, S.W.*
1868	Rankin, William, Esq. *Tiernaleague, Carndonagh, Donegal.*
1866	1670 Ransom, Edwin, Esq. *Kempstone, near Bedford.*
1869	Rassam, Hormuzd, Esq., Assistant Political Resident, Aden. *Care of Messrs. King and Co.,* 45, *Pall-mall, S.W.*
1859	Ratcliff, Charles, Esq., F.S.A. *National Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.*

Year of Election.	
1861	Rate, Lachlan Macintosh, Esq. 9, *South Audley-street, W.*
1846	Ravenshaw, E. C., Esq., M.R.A.S. *Oriental Club, W.; and* 36, *Eaton-sq., W.*
1859	Ravenstein, Ernest G., Esq. *Topographical-depôt, Spring-gardens, S. W.*
1861	Rawlinson, Sir Christopher. *Ham-court, Upton-on-Severn. United University Club, S. W.*
1844	*Rawlinson, Maj.-General Sir Henry C., K.C.B., D.C.L., F.R.S. *Athenæum Club, S. W.; and* 21, *Charles-street, Berkeley-square, W.*
1838	Rawson, His Excellency Rawson Wm., C.B., Colonial Secretary. *Barbadoes.*
1869	Ray, Capt. Alfred William. *The Lodge, Brixton-oval, S.*
1866	1680 Ray, W. H., Esq. *Thorn-house, Ealing.*
1869	Read, Col. William Fitzwilliam. *Junior United Service Club, S. W.*
1863	Reade, W. Winwoode, Esq. *Conservative Club.*
1865	Redhead, R. Milne, Esq. *Springfield, Seedley, Manchester; Conservative Club, S. W.; and Junior Carlton Club, S. W.*
1868	*Redman, John, B., Esq., C.E. 6, *Westminster-chambers, Victoria-street, S. W.*
1861	*Reid, David, Esq. 95, *Piccadilly, W.*
1858	Rees, L. E. R., Esq. 3, *East India-avenue, E.C.*
1859	Reeve, John, Esq. *Conservative Club, S. W.*
1866	*Rehden, George, Esq. 9, *Great Tower-street, E.C.*
1856	Reid, Henry Stewart, Esq., Bengal Civil Service.
1857	1690 Reid, Lestock R., Esq. *Athenæum Club, S. W.; and* 122, *Westbourne-ter., W.*
1861	Reilly, Anthony Adams, Esq. *Belmont, Mullingar.*
1869	*Reiss, James, Esq. 7, *Cromwell-road-houses, South Kensington, W.*
1830	*Rennie, Sir John, C.E., F.R.S., F.S.A. 7, *Lowndes-square, S. W.*
1866	*Rennie, John Keith, Esq., M.A. Camb. 56, *Gloucester-terrace, Hyde-park, W.*
1834	*Rennie, M. B., Esq., C.E. *Care of James Rennie, Esq.*, 9, *Motcombe-street, Belgrave-square, S. W.*
1864	Rennie, W., Esq. 14, *Hyde-park-square. W.*
1830	*Renwick, Lieutenant, R.E.
1861	Reuter, Julius, Esq. 1, *Royal Exchange-buildings, E.C.*
1858	Reynardson, Henry Birch, Esq. *Adwell, near Tetsworth, Oxfordshire.*
1867	1700 Rhodes, Arthur John, Esq. 24, *Kidbrooke-park-road, Blackheath, S.E.*
1868	Richards, Alfred, Esq. *Lamb's-buildings, Temple, E.C.*
1857	Richards, Capt. George H., R.N., F.R.S. *Admiralty, Whitehall, S. W.; and* 12, *Westbourne-terrace-road, W.*
1860	Richards, the Rev. George, D.D.
1864	Richardson, F., Esq. *Park-lodge, Blackheath-park, S.E.*
1859	Rickards, Edward Henry, Esq. 4, *Connaught-place, Hyde-park, W.*
1865	*Rideout, W. J., Esq. 51, *Charles-street, Berkeley-square, W.*
1864	Ridley, F. H., Esq. 11, *Mortimer-road, Kilburn, W.*
1864	Ridley, George, Esq. 2, *Charles-street, Berkeley-square, W.*
1862	*Rigby, Major-General Christopher Palmer. *Oriental Club, W.; and* 14, *Mansfield-street, W.*

Year of Election.	
1862	1710 Rigby, Joseph D., Esq. *Esher, Surrey; and Kew-green, Surrey, W.*
1868	Riley, Capt. Charles Henry. *Junior United Service Club, S.W.*
1860	Rintoul, Robert, Esq. *Windham Club, S.W.*
1830	*Robe, Maj.-General Fred. Holt, C.B. *United Service Club, S.W.; and* 10, *Palace-gardens-terrace, Kensington, W.*
1868	Roberts, Charles W., Esq. *Penrith-house, Effra-road, Brixton, S.*
1861	Roberts, Capt. E. Wynne. *Junior Carlton Club, S.W.; and* 18, *Great Cumberland-street, Hyde-park, W.*
1865	Robertson, A. Stuart, Esq., M.D. *Horwich, near Bolton.*
1860	Robertson, D. Brooke, Esq., H.B.M.'s Consul. *Canton. H. S. King and Co.*
1861	*Robertson, Graham Moore, Esq. 21, *Cleveland-square, Hyde-park, W.*
1868	Robertson, Rev. J. S. S., M.A., F.R.A.S. *Duncrub-castle, Duncrub-park, Dunning, Perthshire, N.B.*
1863	1720 Robertson, R. B., Esq. *H.M.'s Legation, Yokahama, Japan. Care of Capt. Brown,* R.N., 10, *Portland-terrace, Southsea, Hants.*
1830	*Robinson, Rear-Admiral Charles G. 12, *Warwick-road, Maida-hill, W.*
1859	Robinson, Lieut.-Col. D. G., R.E., Director-Gen. of Telegraphs in India. *Calcutta.*
1864	Robinson, H. O., Esq.
1859	Robinson, Sir Hercules G. R. *Governor of Ceylon. Messrs. Burnett,* 17, *Surrey-street, S.W.*
1865	Robinson, J. R., Esq., LL.D., F.S.A. Scot., LL.D., F.R.S.A. du Nord, Copenhagen, F.G.S., Edin. Membre Société Asiatique de Paris, &c. *South-terrace, Dewsbury.*
1860	Robinson, Mr. Serjeant. 8, *King's-Bench-walk, Temple, E.C.; and* 43, *Mecklenburgh-square, W.C.*
1862	Robinson, Lieut.-Col. Sir John Stephen, Bart. *Arthur's Club, S.W.; and* 16A, *Park-lane, W.*
1864	Robinson, John, Esq. *Care of E. Street, Esq.,* 30, *Cornhill, E.C.*
1855	Robinson, Thomas F., Esq., F.L.S. 9, *Derwent-road, South Penge-park, Anerley, S.*
1850	1730 *Robinson, Capt. Walter F., R.N. 15, *Montpellier-villas, Brighton.*
1830	*Rodd, James Rennell, Esq. 29, *Beaufort-gardens, W.*
1860	Roe, Capt. Jno. Septimus, Surveyor-General, W. Australia. *Messrs. Stilwell, Arundel-street, Strand, W.C.*
1863	Rogers, John T., Esq. 38, *Eccleston-square, S.W.*
1861	Rollo, Lord. *Duncrieff-castle, Moffat, N.B.*
1863	Rönn, M. Herman von. 21, *Kensington-park-gardens, W.*
1866	Rooke, Capt. W., R.A. *Formosa, Lymington, Hants.*
1868	Roos, Gustaf, Esq.
1834	*Rose, the Right Hon. Sir George, F.R.S., LL.D. 4, *Hyde-park-gardens, W., and* 25, *Southampton-buildings, Chancery-lane, W.C.*
1868	Rose, Henry, Esq. 8, *Porchester-square, Hyde-park, N.W.*
1861	1740 Rose, Jas. Anderson, Esq. *Wandsworth, Surrey, S.W.; and* 11, *Salisbury-street, W.C.*

Year of Election.	
1857	*Rose, Wm. A., Esq., Alderman. 63, *Upper Thames-street, E.C.; and Befions, Crawford.*
1864	Ross, B. R., Esq. *Care of the Hudson-bay Company, Hudson-bay-house,* 1, *Lime-street, E.C.*
1863	Ross, Wm. Andrew, Esq. 7, *Albemarle-street,* W.
1867	Rossiter, Wm., Esq., F.R.A.S. *South London Working Men's College,* 91, *Blackfriars-road, S.E.*
1868	Ross-Johnson, H. C., Esq. 7, *Albemarle-street, W.*
1864	*Roundell, C. S., Esq. 44, *Piccadilly, W.*
1862	Roupell, Robert Priolo, Esq., M.A., Q.C. A5, *Albany, W.*
1839	*Rous, Vice-Admiral the Hon. Henry John. 13, *Berkeley-square, W.*
1864	Routh, E. J., Esq. *St. Peter's College, Cambridge.*
1862	1750 Rowe, Sir Joshua, C.B., late Chief Justice of Jamaica. 10, *Queen Anne-street, Cavendish-square, W.*
1868	*Rowlands, Percy J., Esq. *India-office, S.W.; and* 24, *Notting-hill-terrace, W.*
1863	Rowley, Capt. C., R.N. 33, *Cadogan-place, S.W.*
1856	Rucker, J. Anthony, Esq. *Blackheath, S.E.*
1861	*Rumbold, Charles James Augustus, Esq. *Downing College, Cambridge; and* 5, *Percival-terrace, Brighton.*
1861	Rumbold, Thomas Henry, Esq.
1860	Rumley, Major-General Randall, Vice-President Council of Military Education. 12, *Cadogan-place, S.W.*
1858	*Russell, Arthur John Edward, Esq., M.P. 2, *Audley-square, W.*
1869	Russell, George, Esq., M.A. *Viewfield, Southfields, Wandsworth; and* 16, *Old Change, St. Paul's, E.C.*
1830	*Russell, Jesse Watts, Esq., D.C.L., F.R.S.
1830	1760 Russell, John, Earl, F.R.S. 37, *Chesham-place, S.W.; Pembroke-lodge, Richmond, S.W.; Endsleigh-ho., Devon; and Gart-ho., near Callandar, N.B.*
1860	Russell, Wm. Howard, Esq., LL.D.
1860	Rutherford, John, Esq. 2, *Cavendish-place, Cavendish-square, W.*
1857	*Ryder, Admiral, Alfred P. *U.S. Club, S.W.; and Launde-abbey, Uppingham.*
1864	Ryder, G., Esq. 10, *King's-Bench-walk, Temple, E.C.*
1869	Rylands, Peter, Esq. *Bewsey-house, Warrington.*
1868	Sabben, J. T., Esq., M.D., *Northumberland-house, Stoke Newington, N.*
1852	Sabine, Lieut.-General Sir Edw., K.C.B., R.A., Pres. R.S., F.R.A.S., &c. &c. 13, *Ashley-place, Victoria-street, Westminster, S.W.; and Woolwich, S.E.*
1847	St. Asaph, Rt. Rev. Thos. Vowler Short, Bishop of. *Palace, St. Asaph, N. Wales.*
1869	St. Clair, Alexander Bower, Esq., H.B.M. Consul, Jassy, Moldavia. *Care of E. Hertslet, Esq., Foreign-office, S.W.*
1857	1770 St. David's, Connop Thirlwall, Bishop of. *Abergwilly-palace, Carmarthen.*
1867	St. John, Lieut. Oliver Beauchamp Coventry, R.E. *National Club, S.W.*
1863	St. John, R. H. St. Andrew, Esq., 60th Rifles.

Year of Election.
1862 St. John, Spenser, Esq., Chargé d'Affaires, Port-au-Prince, Haiti. 25, *Grove-end-road, St. John's-wood, N.W.*
1863 Sale, Lieut. M. T., R.E. *The Crescent, Rugby; and Cherrapoonjee, Bengal.*
1867 Salkeld, Colonel J. C. (H.M.I. Forces). 29, *St. James's-street, S.W.*
1868 Salles, J. de. Esq. *Belgrave-mansions, Grosvenor-gardens.*
1869 *Salmond, Robert, Esq. *Reform Club, S.W.*; 14, *Woodside-crescent, Glasgow; and Rankinston, Patna, Ayr.*
1845 *Salomons, Alderman Sir David, Bart., M.P., F.R.S., F.R.A.S. 26, *Great Cumberland-place, Hyde-park, W.; and Broom-hill, near Tunbridge-wells.*
1863 *Salt, Henry, Esq. 29, *Gordon-square, W.C.*
1861 1780 Salting, William Severin, Esq. 60, *St. James's-street, S.W.*
1861 *Sandbach, Wm. Robertson, Esq. 10, *Prince's-gate, Hyde-park, S.W.*
1867 Sandeman, David George, Esq., *Cambridge-house, Piccadilly, W.*
1862 Sanford, Major Henry Ayshford. 29, *Chester-street, Grosvenor-place, W.; and Nynehead-court, Wellington, Somerset.*
1860 Sarel, Lieut.-Colonel H. A., 17th Lancers. *Army and Navy Club, S.W.; and Shanghae.*
1862 Sargood, F. J., Esq. *Moorgate-street-buildings, E.C.*
1869 Sarll, John, Esq. *Englefield-house, De Beauvoir-town, N.*
1860 Sartoris, Alfred, Esq. *Abbottswood, Stow-on-the-Wold.*
1852 Saumarez, Captain Thomas, R.N. *The Firs, Jersey.*
1866 Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, *Finsbury-circus; and Granville-park, Blackheath, S.E.*
1864 1790 Saurin, Admiral E. *Prince's-gate, S.W.*
1863 Sawyer, Col. Charles, 6th Dragoon Guards. 50, *Sussex-square, Kemp-town, Brighton.*
1838 Scarlett, Lieut.-General the Hon. Sir J. Yorke, K.C.B. *Portsmouth.*
1861 Schenley, Edward W. H., Esq. 14, *Prince's-gate, S.W.*
1866 Scott, Adam, Esq. 10, *North-street, Finsbury, E.C.*
1866 Scott, Arthur, Esq. *Travellers' Club, S.W.*
1859 Scott, Lord Henry. 3, *Tilney-street, Park-lane, W.*
1861 *Scott, Hercules, Esq. *Brotherton, near Montrose, N.B.*
1855 Scott, Admiral Sir James, K.C.B. *United Service Club, S.W.*
1866 Scott, John, Esq., M.D.
1868 1800 Scott, William Cumin, Esq. *Mayfield-house, Blackheath-park, S.E.*
1863 Scovell, George, Esq. 34, *Grosvenor-place, S.W.*
1861 Searight, James, Esq. 80, *Lancaster-gate, W.*
1869 Searle, Frank Furlong, Esq., M.R.C.S., &c. 26, *Cathedral-yard, Exeter.*
1867 Seaton, Col. the Right Hon. Lord. D 3, *Albany, W.*
1868 Seaton, Joseph, Esq., M.D. *Halliford-house, Sunbury, Middlesex, S.W.*
1830 *Sedgwick, the Rev. A., Woodwardian Lecturer, M.A., F.R.S. *Athenæum Clu S.W.; and Cambridge.*
1869 Sedgwick, John Bell, Esq. 1, *St. Andrew's-place, Regent's-park, N.W.*
1862 Seemann, Berthold, Esq., PH. DR., F.L.S. 57, *Windsor-road, Holloway, N.*

Year of Election.	
1866	Sendall, Walter T., Esq., Inspector of Schools in Ceylon. *Colombo; and Civil Service Club, S. W.*
1865	1810 Sercombe, Edwin, Esq. 49, *Brook-street, Grosvenor-square, W.*
1858	*Serocold, Charles P., Esq. *Brewery, Liquorpond-street, E.C.*
1853	Sevin, Charles, Esq. 155, *Fenchurch-street, E.C.*
1867	Seymour, Alfred, Esq., M.P. 47, *Eaton-square, S.W.*
1858	Seymour, George, Esq. 54, *Lime-street, E.C.*
1855	Seymour, Admiral Sir Geo. F., K.C.B., G.C.H. 115, *Eaton-square, S.W.*
1853	*Seymour, Henry Danby, Esq. 39, *Upper Grosvenor-street, W.; Knoley-Hindon, Wilts; and Glastonbury, Somersetshire.*
1854	*Shadwell, Admiral Charles F. A., C.B. *Meadow-bank, Melksham, Wilts.*
1860	*Shadwell, Lieut.-Colonel Lawrence. 9, *Queensberry-place, Cromwell-road, Kensington, W.*
1856	*Share, Staff Commander James Masters, R.N. *The Willows, Wyke Regis, Weymouth, Dorset.*
1866	1820 Sharp, Henry T., Esq. 102, *Piccadilly, W.*
1861	Sharp, Peter, Esq. *Oakfield, Ealing, W.*
1861	*Sharpe, William John, Esq. 1, *Victoria-street, Westminster, S.W.; and Norwood, Surrey, S.*
1862	*Shaw, John, Esq. *Finegand, Otago, New Zealand.*
1861	Shaw, John Ralph, Esq. *Arrowe-park, Birkenhead.*
1858	Shea, John, Esq., M.D., Surgeon R.N. 84, *Blackfriars-road, S.*
1846	Sheffield, George A. F. C., Earl of. 20, *Portland-place, W.; and Sheffield-park, Sussex.*
1857	Sheil, Major-Gen. Sir Justin, K.C.B. 13, *Eaton-place, Belgrave-square, S.W.*
1868	*Shelley, Capt. G. Ernest. 32, *Chesham-place, W.*
1861	Shephard, Chas. Douglas, Esq., Surg. R.N. *H.M.S. 'Valiant,' Foynes, County Limerick.*
1867	1830 Shepherd, Chas. Wm., Esq., M.A., F.Z.S. *Trottersclifffe, Maidstone.*
1860	Sheridan, H. Brinsley, Esq. *Bellefield-house, Parson's-green, Fulham, S.W.*
1863	Sheridan, Richd. B., Esq.. M.P. 48, *Grosvenor-place, S.W.*
1857	Sherrin, Joseph Samuel, Esq., LL.D., PH. DR. *Leyton-house, Leyton-crescent, Kentish-town, N.W.*
1859	*Sherwill, Lieut.-Col. W. S., F.G.S. *Professor of Surveying, Civil Engineers' College, Calcutta; and Perth, N.B.*
1858	*Shipley, Conway M., Esq. *Twyford Moors, Winchester; and Army and Navy Club, S.W.*
1868	Shirley, Lionel H., Esq., C.E., &c. *Raleigh Club; and The Lypiatts, Cheltenham.*
1866	Sholl, Charles, Esq., C.E.
1856	Shuttleworth, Sir J. P. Kay, Bart. 38, *Gloucester-square, W.; and Gawthorp-hall, Burnley, Lancashire.*
1865	*Silva, Frederic, Esq. 12, *Cleveland-square, Bayswater, W.*
1859	1840 Silver, the Rev. Fred., M.A., F.R.A.S. *Norton-rectory, Market Drayton, Salop.*
1859	*Silver, Stephen Wm., Esq. 66, *Cornhill, E.C.; and Norwood-lodge, Lower Norwood, S.*

Year of Election.	
1860	Sim, John Coysgame, Esq. 13, *James-street, Buckingham-gate, S.W.*
1853	Simmons, Edward R., Esq., Barrister-at-Law. 4, *Hyde-park-gate, S.W.*
1848	*Simmons, Major-General Sir John L. A., R.E., KC.B. *Lieut.-Governor Royal Military Academy, Woolwich, S.E.*
1866	Simons, Henry M., Esq. *Tyersall-crescent, Wood-road, Sydenham-hill, S.E.*
1864	Simpson, Frank, Esq. 17, *Whitehall-place, S.W.*
1862	Simpson, Henry Bridgeman, Esq. 44, *Upper Grosvenor-street, W.*
1863	*Simpson, Wm., Esq. 64, *Lincoln's-inn-fields, W.C.*
1866	*Sims, Richard Proctor, Esq., C.E. *Malabar-hill, Bombay. Care of Messrs. King and Co.*
1858	1850Skelmersdale, Edward, Lord. *Lathom-park, Ormskirk, Lancashire.*
1866	Skinner, John E. H., Esq. 3, *Dr. Johnson's-buildings, Temple, E.C.*
1863	Skrine, Hy. D., Esq. *Warleigh-manor, near Bath.*
1861	Sladen, Rev. Edward Henry Mainwaring. *Alton, near Marlborough, Wilts.*
1861	Sligo, G. J. Browne, Marquis of. 14, *Mansfield-street, W.; and Westport, County Mayo.*
1865	Smedley, Joseph V., Esq., M.A. *Oxford and Cambridge Club, S.W.*
1860	*Smith, Augustus Henry, Esq. *Flexford-house, Guildford.*
1857	*Smith-Bosanquet, Horace, Esq. *Broxbourne-borough, Hoddesdon.*
1866	Smith, Drummond Spencer-, Esq. 7, *Mount-street, Berkeley-square, W.*
1859	Smith, Edward, Esq. *Windham Club, S.W.*
1867	1860Smith, Frederick, Esq. *The Priory, Dudley.*
1853	Smith, George, Esq. *Emilena-house, Upper Norwood, S.*
1857	Smith, George R., Esq. 73, *Eaton-square, S.W.; and Telsden-park, Surrey.*
1865	Smith, Guildford, Esq. 63, *Charing-cross, S.W.*
1861	Smith, Jervoise, Esq. 47, *Belgrave-square, S.W*
1853	Smith, John Harrison, Esq. 55, *Chepstow-place, Bayswater, W.*
1853	Smith, John Henry, Esq. 1, *Lombard-street, E.C.; and Purley, Croydon, Surrey.*
1861	Smith, J. Sidney, Esq., Barrister-at-Law. *Sidney-lodge, Wimbledon-common, S.W.*
1861	*Smith, Joseph Travers, Esq. 25, *Throgmorton-street, E.C.*
1838	*Smith, Octavius Henry, Esq. *Thames-bank, Westminster, S.W.*
1868	1870*Smith, Major Robert M., R.E., Director of the Telegraphic Establishment in Persia, Teheran. *Care of the Foreign-office, S.W.*
1857	Smith, Captain Philip, Grenadier Guards.
1841	*Smith, Thomas, Esq.
1859	*Smith, W. Castle, Esq. 1, *Gloucester-terrace, Regent's-park, N.W.*
1857	Smith, Wm. Gregory, Esq. *Hudson-bay Company, Fenchurch-street, E.C.*
1859	Smith, William Henry, Esq., M.P. 1, *Hyde-park-street, W.*
1869	Smyth, Colonel Edmund. *Elkington-hall, Wetton-hill, Lincolnshire.*
1869	*Smyth, Warington, Esq., F.R.S. 92, *Inverness-terrace, W.*
1837	*Smyth, Rear-Adm. William. *Care of Messrs. Child and Co., Temple-bar.*
1850	*Smythe, Colonel William J., R.A.

Year of Election.	
1863	1880Snowden, Francis, Esq., M.A. 1, *Dr. Johnson's-buildings, Temple, E.C.*
1865	Solomons, Hon. Geo. *Craven Hotel, W.C.; and Jamaica.*
1839	*Somers, Charles, Earl. 33, *Prince's-gate, S. W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.*
1862	Somerset, Capt. Leveson E. H., R.N. *Care of Messrs. Chard,* 3, *Clifford's-inn, Fleet-street, E.C.*
1858	*Somes, Joseph, Esq. *Burntwood-lodge, Wandsworth-common, S.W.*
1855	Sopwith, Thos., Esq., M.A., C.E., F.R.S. 103, *Victoria-street, Westminster, S.W.*
1845	*Sotheby, Lt.-Col. Fred. S., C.B., F.R.A.S. 100, *Park-lane, W.*
1861	South, John Flint, Esq. *Blackheath-park, S.E.*
1860	*Southey, Jas. Lowther Esq. *Care of Messrs. Stilwell.*
1869	Southwell, Thomas Arthur Joseph, Viscount. *Windham Club, S.W.*
1865	1890Spalding, Samuel, Esq. 7, *Upper Park-road, South Hampstead.*
1850	*Spencer-Bell James, Esq. *Devonshire-place, Portland-place, W.*
1867	Spicer, Edward, Esq. *Woodside, Muswell-hill, N.*
1863	Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment. *Eastern-parade, Southsea.*
1855	*Spottiswoode, William, Esq., F.R.S. 50, *Grosvenor-place, S.W.*
1859	*Spratt, Capt. Thos. A. B., R.N., C.B. *Clare-lodge, Nevill-park, Tunbridge-wells, Kent.*
1866	Spruce, Richard, Esq., PH. DR. *Welburn, Castle Howard, York.*
1859	Stafford, Edward W., Esq. *Colonial Secretary of New Zealand; care of Mr. J. S. Tytler,* 19, *Castle-street, Edinburgh.*
1868	Staley, Dr. Thomas (Bishop of Honolulu). *Upper Gore, Kensington; and Honolulu, Hawaian Islands.*
1853	Stanford, Edward, Esq. 6, *Charing-cross, S.W.*
1855	1900Stanhope, Philip Henry, Earl, Pres. Soc. of Antiquaries. 3, *Grosvenor-place-houses, Grosvenor-place, S.W. and Chevening, Sevenoaks, Kent.*
1860	*Stanhope, Walter Spencer, Esq. *Cannon-hall, Barnsley, Yorkshire.*
1856	Stanley, Edmund Hill, Esq. *Craven-hotel, Strand W.C.*
1869	Stanton, Charles Holbrow, Esq. *Mitre-court-buildings, Inner Temple, E.C.*
1863	Stanton, Geo., Esq. *Coton-hill, Shrewsbury and Conservative Club, S.W.*
1867	Stanton, Henry, Esq. 1, *River-street, Myddelton-square, W.C.*
1856	Statham, John Lee, Esq. 60, *Wimpole-street, W.*
1863	*Staveley, Miles, Esq. *Old Sleningford-hall, Ripon.*
1868	Staveley, Major-Gen. Sir Charles, K.C.B. *Government-house, Devonport; and United Service Club, S.W.*
1869	Stebbing, Edward Charles, Esq. *National Debt Office,* 19, *Old Jewry, E.C.*
1867	1910Steel, J. P., Esq., Lieut. R.E. *Junior United Service Club, S.W. Care of Messrs. Grindlay and Co.*
1868	Steel, William Strang, Esq. 13, *Leadenhall-street, E.C.*
1830	*Stephen, Sir George. *Melbourne. Care of Mr. H. W. Ravenscroft,* 7, *Gray's-inn-square, W.C.*

Year of Election.	
1869	Stephenson, B. Charles, Esq. 12, *Bolton-row, Mayfair, W.*
1857	Stephenson, Sir R. Macdonald, C.E. 72, *Lancaster-gate, W.; and East-cottage, Worthing.*
1868	Stephenson, Henry P., Esq. 8, *St. Mary-axe, E.C.*
1866	Stepney, A. K. Cowell, Esq. 6, *St. George's-terrace, Knightsbridge, W.*
1860	Sterling, Col. Sir Anthony. *South-lodge, South-place, Knightsbridge, W.*
1862	Sterry, Henry, Esq. 7, *Paragon, Southwark, S.E.*
1869	Steuart, Col. T. R., Bombay Army. *Esgair, Machynlleth, Wales.*
1855	1920Stevens, Henry, Esq., F.S.A. 4, *Trafalgar-square, W.C.*
1841	Stevenson, Thomas, Esq., F.S.A. 37, *Upper Grosvenor-street, W.*
1866	Stewart, Rev. Dr. James. *Lovedale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.*
1860	*Stewart, Major J. H. M. Shaw, Royal Madras Engineers.
1869	Stewart, J. L., Esq., M.D., Forest Department, India. *Kew, W.*
1868	Stirling, the Hon. Edward. 34, *Queen's-gardens, Hyde-park, W.*
1860	Stirling, Capt. Frederick H., R.N. *H.M.S. 'Hero;' and United Service Club, S.W.*
1863	Stirling, Sir Walter, Bart. 36, *Portman-square, W.*
1868	Stock, Thomas Osborne, Esq., M.P. 20, *King-street, St. James's, S.W.*
1860	Stocker, John Palmer, Esq. 93, *Oxford-terrace, Hyde-park, W.*
1845	1930*Stokes, Rear-Admiral John Lort. *United Service Club, S.W.; and Scotchwell, Haverfordwest, Wales.*
1868	Stone, David H., Esq., Alderman. *Sydenham-hill, S.*
1867	*Story, Edwin, Esq., M.A. 3, *King Edward's-terrace, Liverpool-road, Islington, N.*
1868	Stovin, Rev. Charles F. 8, *Grosvenor-mansions, Victoria-street, S.W.*
1866	Strachey, Colonel Richard, R.E., F.R.S. 29, *Lancaster-gate, Hyde-park, W.*
1861	Strange, Lieut.-Col. Alexander. *India Store Department, Belvedere-road, Lambeth, S.*
1858	Stratford de Redcliffe, Stratford Canning, Viscount. 29, *Grosvenor-square, W.*
1864	Straton, Rev. N. D. J. *Kirkby-wharf, Tadcaster.*
1860	Strickland, Edward, Esq., C.B., Commissary-General. *Halifax, Nova Scotia.*
1868	*Strode, Alf. Rowland Chetham, Esq. *Dunedin, Otago, New Zealand. Care of J. G. Cooke, Esq., 47, Mount-street, Grosvenor-square, W.*
1865	1940Strong, F. K., Esq., K.H. *Hamburg, Germany;* 8, *St. Martin's-place, S.W.*
1853	Strousberg, Dr. Bethel Henry. 70, *Wilhelm-strasse, Berlin. Care of Messrs. Asher.*
1853	Strutt, George H., Esq., F.R.A.S. *Bridge-hill, Belper.*
1858	Strutt, Captain Hammel Ingold, F.R.A.S. *Royal Mail Steam Packet Company Southampton.*
1853	*Strzelecki, Count P. E. de, C.B., F.R.S. 23, *Savile-row, W.*
1859	Stuart, Lieut.-Col. J. F. D. Crichton. 25, *Wilton-cres., Belgrave-sq., S.W.*
1861	Stuart, Vice-Chancellor Sir John. 11 *and* 12, *Old-buildings, Lincoln's-inn, W.C.;* 5, *Queen's-gate, Hyde-park, W.; and Grushernish, Isle of Skye, Inverness-shire.*
1866	Stuart, Major Robert. *Janina, Albania. Care of Messrs. Bull, Hunter, and Co.,* 52, *Wigmore-street, W.*

Year of Election.	
1858	Sudeley, Lord. 5, *Seamore-place, Curzon-street, W.*
1857	Sulivan, Rear-Admiral Sir Bartholomew J., R.N., K.C.B.
1865	1950 Sullivan, Capt. T. W., C.B., R.N. *Kimpton, Welwyn, Herts.*
1869	Summerhayes, William, Esq., M.D. 18, *Sandringham-gardens, Ealing, W.*
1862	Surridge, Rev. Henry Arthur Dillon, M.A. 21, *Berners-street, W.*
1862	Surtees, Capt. Charles Freville. *Chalcott-house, Long Ditton, Surrey.*
1861	*Sutherland, George Granville William, Duke of. *Stafford-house, St. Jam Palace, S.W.*
1869	Sutherland, Robert, Esq. *Egham-rise, Surrey.*
1869	Sutherland, Thomas, Esq. H 3, *Albany, Piccadilly, W.*
1857	Swanzy, Andrew, Esq. *Sevenoaks, Kent.*
1836	*Swinburne, Rear-Admiral Charles H. *Capheaton, near Newcastle-upon-Ty*
1862	*Swinburne, Lieut. Sir John, Bart., R.N. *Capheaton, Newcastle-on-Tyne.*
1863	1960 Swinhoe, R., Esq., H.B.M. Consul. 33, *Oakley-square, S.W.*
1851	Sykes, Colonel William Henry, M.P., F.R.S., Hon. M.R.I.A. *Athenæum C S.W.; and* 47, *Albion-street, Hyde-park, W.*
1864	Symonds, F., Esq., M.D. *Beaumont-street, Oxford.*
1852	*Synge, Col. Millington H., R.E. *Alvercliff, Alverstoke, Hants.*

Year of Election.	
1852	Tagart, Courtenay, Esq. *Rockleaze Point, Durdham Down, near Bristol.*
1859	Tagart, Francis, Esq. 31, *Craven-hill-gardens, Hyde-park, W.*
1866	Taintor, Edward C., Esq. (Impl. Chinese Customs). *Tientsin, China. Care H. C. Batchelor, Esq.,* 155, *Cannon-street, E.C.*
1864	Tait, P. M., Esq. 38, *Belsize-park, N.W.; and Oriental Club, W.*
1857	*Tait, Robert, Esq. 14, *Queen Anne-street, W.*
1867	Talbot, Right Hon. Richard Gilbert. *Ballinclea, Kingstown, County Dublin.*
1861	1970 Talbot de Malahide, James Talbot, Lord. *Malahide Castle, Co. Dublin.*
1861	Taylor, Commander A. Dundas, I.N. 2, *Gloucester-villas, Upper Eglinton-ro Shooter's-hill, S.E.*
1869	Taylor, George N., Esq. 3, *Clarendon-place, Hyde-park, W.*
1865	Taylor, H. L., Esq. *Reform Club, S.W.; and* 23, *Phillimore-gardens, K sington, W.*
1865	Taylor, Rev. Jas. Hudson. *Ningpo, China. Care of Mr. Berger, Saint-h East Grinstead.*
1863	Taylor, John, Esq. *The Birches, Kingston-hill.*
1867	*Taylor, John George, Esq. *H.B.M. Consul in Kurdistan, Diarbekr.*
1854	*Taylor, John Stopford, Esq., M.D. 1, *Springfield, St. Anne-street, Liverpoo*
1863	Taylor, Col. R. C. H. 16, *Eaton-place, S.W.; and Carlton Club, S.W.*

Year of Election.	
1864	Taylor, W. R., Esq.
1857	1980 Teesdale, John M., Esq. *Eltham-house, Eltham, S.E.*
1863	Tegg, Wm., Esq. 13, *Doughty-street, Mecklenburg-square, W.C.*
1865	Temple, Sir Richard, K.C.S.I. *Oriental Club, W.*
1860	Templeton, John, Esq. 24, *Budge-row, E.C.*
1857	Tennant, Professor James. 149, *Strand, W.C.*
1830	*Thatcher, Colonel E.I.C.
1865	Theed, William S., Esq. 18, *Carlisle-terrace, Kensington, W.*
1863	Thomas, G., Esq. 6, *Queen's-gate-terrace, Hyde-park, W.*
1854	Thomas, Henry Harrington, Esq. 8, *Camden-crescent, Bath.*
1864	Thomas, J. R., Esq., Staff Assist. Surg. *Castle-hill, Fishguard, Pembrokeshire.*
1865	1990 Thomas, John Henwood, Esq. *East India Dept., Custom-house, E.C.*
1869	Thompson, Henry Yates, Esq. *Vice-regal Lodge, Dublin; 2, Cleveland-row, St. James's, S.W.; and Thingwall-park, near Liverpool.*
1854	Thompson, William C., Esq.
1863	Thomson, James, Esq. *Dunstable-house, Richmond.*
1863	Thomson, James Duncan, Esq., Portuguese Consul. *St. Peter's-chambers, Cornhill, E.C.*
1848	*Thomson, J. Turnbull, Esq., Chief Surveyor. *Otago, New Zealand.*
1866	Thomson, John, Esq. *Care of John Little, Esq., 21, Cannon-street, E.C.*
1861	*Thomson, Ronald Ferguson, Esq., 1st Attaché to the Persian Mission. *Care of F. B. Alston, Esq., Foreign-office, S.W.*
1854	*Thomson, Thomas, Esq., M.D., F.R.S. *Hope-house, Kew, W.*
1865	Thomson, W. T., Esq. *Arlary-house, Kinross.*
1862	2000 *Thorne, Augustus, Esq. 4, *Cullum-street, City, E.C.*
1867	Thornton, Edward, Esq., C.B. *Harrow.*
1847	Thornton, Rev. Thomas Cooke, M.A., M.R.I. *Brock-hall, near Weedon, Northamptonshire.*
1858	Thorold, Rev. A. W. 16, *Bedford-square, W.C.*
1868	Thorold, Alexander W. T. Grant, Esq. *Medsley, Great Grimsby, Lincolnshire.*
1854	Thorold, Henry, Esq. *Cuxwold, Lincolnshire.*
1861	Thrupp, John, Esq.
1859	Thuillier, Lt.-Col. H. L., Surveyor-General of India. *Calcutta; Messrs. Grindlay, and Co. Care of J. Walker, Esq., India Office.*
1865	Thurburn, C. A., Esq. 29, *Queensborough-terrace, Kensington-gardens, W.*
1864	*Thurburn, Hugh, Esq. 108, *Westbourne-terrace, W.*
1861	2010 Thurlow, the Hon. Thos. J. Hovell. *British Embassy, The Hague. Care of J. B. Alston, Esq., Foreign-office, S.W.*
1868	Tilley, Henry Arthur, Esq. *Hanwell, Middlesex, W.*
1839	*Tinne, John A., Esq. *Briarley, Aigburth, near Liverpool.*
1862	Todd, John, Esq. *Sydney. Messrs. Bligh and Harbottle, 1, Alderman-walk, E.C.*
1865	Todd, Rev. John W. *Tudor-hall, Forest-hill, Sydenham, S.*
1853	*Tomlin, George Taddy, Esq., F.S.A. *Combe-house, Bartonfields, Canterbury.*

Year of Election.	
1853	Tomline, George, Esq. 1, *Carlton-house-terrace, S.W.*
1835	*Tooke, Arthur Wm., Esq., M.A. *Pinner-hill-house, near Watford, Middles*
1856	Torrance, John, Esq. 5, *Chester-place, Hyde-park-square, W.*
1866	Torrens, Robert Richard, Esq. 2, *Gloucester-place, Hyde-park, W.; The Cott, Holm, near Ashburton, South Devon.*
1859	2020 Townsend, Commander John, R.N. *Lona, Weston-super-Mare.*
1866	Townson, Wm. Parker, Esq., B.A. Cantab. *Care of Miss Townson, Ash- Caton, near Lancaster.*
1846	*Towry, George Edward, Esq.
1858	Towson, J. Thomas, Esq. *Secretary Local Marine Board, Liverpool.*
1864	*Toynbee, Capt. Hy. 25, *Inverness-road, Kensington-gardens, W.*
1863	*Tozer, Rev. H. F., M.A. *Exeter College, Oxford.*
1864	Tracy, the Hon. C. H. 11, *George's-street, W.*
1863	*Travers, Arch., Esq. *Addison-road (opposite the Napier-road), Kensington,*
1867	Tremenheere, Col. C.W., R.E. *Bombay.*
1859	Tremlett, Rev. Francis W., M.A., D.C.L., HON. PH.D. of Jena. *Belsize-p Hampstead, N.W.*
1869	2030 Trench, Capt. Frederic. *Naval and Military Club, Piccadilly, W.*
1865	*Trench, Capt. the Hon. Le Poer, R.E. 32, *Hyde-park-gardens, W.; and Ordn survey-office, Pimlico, S.W.*
1863	Trestrail, Rev. Frederick. *Stanmore-villa, Beulah-hill, Upper Norwood, S.*
1862	Trevelyan, Sir Charles Edward, K.C.B. 8, *Grosvenor-crescent, S.W.*
1830	Trevelyan, Sir Walter Calverly, Bart., M.A., F.S.A., F.L.S., F.R.S.N.A., &c. *næum Club, S.W.; Wallington, Northumberland; and Nettlecombe, Som*
1864	Trimmer, Edmund, Esq. *Care of Messrs. Trimmer and Co., New chambers, Bishopsgate-street, E.C.*
1867	Tritton, Joseph Herbert, Esq. 54, *Lombard-street, E.C.*
1869	Trotter, Lieut. Henry, R.E. 11, *Hertford-street, Mayfair, W.*
1867	Tryon, Capt. George, R.N., C.B. *Army and Navy Club, S.W.*
1862	Tuckett, Fras. Fox, Esq. *Frenchay, near Bristol.*
1835	2040 *Tuckett, Frederick, Esq. 4, *Mortimer-street, Cavendish-square, W.*
1865	Tuckett, Philip D., Esq. 28, *Cleveland-gardens, Hyde-park, W.*
1852	Tudor, Edward Owen, Esq., F.S.A. 80, *Portland-place, W.*
1857	Tudor, Henry, Esq. 80, *Portland-place, W.*
1864	Turnbull, George, Esq., C.E., F.R.A.S. 23, *Cornwall-gardens, South Kensingt*
1834	*Turnbull, Rev. Thomas Smith, F.R.S. *University Club, S.W.; and Bl Norfolk.*
1863	Turner, Thos., Esq. *Guy's Hospital, Southwark, S.*
1867	Tweedie, Capt. Michael, R.A. *Care of R. W. Tweedie, Esq.*, 5, *Lincoln' fields.*
1864	*Twentyman, A. C., Esq. *Tettenhall-wood, near Wolverhampton.*
1863	Twentyman, Wm. H., Esq. *Ravensworth, St. John's-wood-park, N.W.*
1863	2050 *Twiselton, Hon. E. F. *Rutland-gate, S.W.*
1849	Twiss, Sir Travers, D.C.L., F.R.S. 19, *Park-lane, W.*

Twyford, Capt. A. W., 21st Hussars. *Reform Club, S.W.; and Cosham-house, Cosham, Hants. Care of Mr. Murray, 7, Whitehall-place, S.W.*

Tyer, Edward, Esq., C.E., F.R.A.S. 15, *Old-jewry-chambers, E.C.*

*Tyler, George, Esq. 24, *Holloway-place, Holloway-road, N.*

Tytler, Capt. W. Fraser. *Aldowrie, Inverness.*

Underdown, E. M. Esq., 3, *King's-Bench-walk, Temple, E.C.*

Underhill, Edward Bean, Esq., LL.D. *Derwent-lodge, Thurlow-road, Hampstead, N.W.*

Unwin, Howard, Esq., C.E. 24, *Bucklersbury, E.C.*

Ussher, John, Esq. *Arthur's Club, St. James's-street, S.W.*

2060 *Vacher, George, Esq. *Manor-house, Teddington.*

*Vander Byl, P. G., Esq., M.P. *Care of Mr. H. Blyth, 17, Gracechurch-st., E.C.*

Vane, G., Esq. *Ceylon. Messrs. Price and Boustead.*

*Vaughan, James, Esq., F.R.C.S., Bombay Army. *Builth, Breconshire.*

Vaughan, J. D., Esq., Assist. Res. Councillor and Police Magistrate of Singapore. *Care of J. Tupp, Esq., 4, Lancaster-road, Notting-hill, W.*

Vaux, William S. W., Esq., M.A., F.S.A. *British Museum, W.C.*

*Vavasour, Sir Henry M., Bart. 8, *Upper Grosvenor-street, W.*

Vavasseur, James, Esq. *Knockholt, near Sevenoaks, Kent.*

Venner, Capt. Francis John S. *Dilston-house, Upper Norwood, S.; and Elm-bank, near Worcester.*

*Vereker, the Hon. H. P., LL.D., H.M. Consul at Rio Grande do Sul. 1, *Portman-square, W.*

2070 Verner, Edward Wingfield, Esq., M.P. *The Aske, Bray, County Wicklow.*

*Verney, Edmond H., Commr. R.N. 32, *South-street, Grosvenor-square, W.*

*Verney, Major Sir Harry C., Bart., M.P., F.R.A.S. *Travellers' Club, S.W.;* 32, *South-street, Grosvenor-square, W.; and Claydon-house, Bucks.*

Verrey, Charles, Esq.

Verulam, James Walter, Earl of. *Gorhambury, near St. Alban's; Barry-hill, Surrey; and Messing-hall, Essex.*

Vile, Thomas, Esq. 75, *Oxford-terrace, W.*

*Vincent, Minos C., Esq., C.E. *Frankfort, Ohio, U.S.; and* 127, *Strand, W.C.*

Vincent, John, Esq. 4, *Granville-park, Blackheath, S.E.*

Vines, William Reynolds, Esq., F.R.A.S. *Care of R. P. Hollyer, Esq., Ivy Garth, Shrewsbury-lane, Shooter's-hill, Plumstead, S.E.; and* 4, *Thavies-inn, Holborn-hill, E.C.*

Vivian, Major Quintus, late 8th Hussars. 17, *Chesham-street, S.W.*

2080 *Vyvyan, Sir Richard Rawlinson, Bart., F.R.S. *Trelowarren, Cornwall.*

Year of Election	
1852	Wade, Mitchell B., Esq. 66, *South John-street, Liverpool.*
1864	Wade, R. B., Esq. 13, *Seymour-street, Portman-square, W.*
1863	Wade, Thos. F., Esq., C.B., H.B.M. Secretary of Legation. *Pekin, China.*
1853	*Wagstaff, William Raester, Esq., M.D., M.A.
1869	Waite, Charles, Esq., LL.D., Principal of St. John's College. *Weighton-road, South Penge-park, S.E.*
1863	Waite, Henry, Esq. 3, *Victoria-street, Pimlico, S.W.*
1867	*Waite, Rev. John. 48, *Torrington-square, Bloomsbury, W.C.*
1864	Wakefield, E. T., Esq. 40, *Pembridge-villas, Bayswater, W.*
1866	Walker, Alexander, Esq. *Preston, Kirkbean, near Dumfries.*
1862	2090 Walker, Col. C. P. Beauchamp, C.B. 97, *Onslow-square, S.W.; and Unite Service Club, S.W.*
1861	Walker, Edward Henry, Esq., Consul at Cagliari. *Newton-bank, Chester.*
1863	*Walker, Frederick John, Esq. *Alltyr Odyn, Llandyssil, Carmarthen, Wales.*
1863	Walker, James, Esq., Managing Director of Madras Railway. 23, *Cambridge-square, Hyde-park, W.*
1859	*Walker, Lt.-Col. James, Bombay Engineers. *Murree, near Rawul Pindé, Punjab Care of Messrs. H. S. King and Co., Pall-mall, S.W.*
1830	Walker, John, Esq., Hydrog. India Office. 9, *Castle-street, Holborn, W.C.*
1861	*Walker, John, Esq. 60, *Porchester-terrace, W.*
1858	*Walker, Captain John, H.M.'s 66th Foot. *Broom-hill, Colchester.*
1864	Walker, R. B. N., Esq. *Care of Mr. Blissett, 38, South Castle-st., Liverpool.*
1863	*Walker, T. F. W., Esq. 6, *Brock-street, Bath; and Athenæum Club, S.W.*
1853	2100 Walker, Captain William Harrison, H.C.S. 3, *Gloucester-terrace, W.; and Board of Trade, S.W.*
1861	Walker, Rev. William. *Grammar-school, Hanley Castle, Upton-on-Severn.*
1861	Walker, Rev. William Henry, M.A. *Necton-rectory, Shipham, Norfolk.*
1866	Walker, William, Esq., F.S.A. 48, *Hilldrop-road, Tufnell-park, N.*
1868	Walkinshaw William, Esq. 74, *Lancaster-gate, Hyde-park, W.*
1854	Wallace, Alfred Russell, Esq. 9, *St. Mark's-crescent, Regent's-park, N.W.*
1861	Wallace, Rev. Charles Hill, M.A. 3, *Harley-place, Clifton, Bristol.*
1868	Waller, Major George Henry. 16, *Eaton-square, S.W.*
1864	Waller, Rev. Horace. *St. John's, Chatham.*
1865	Waller, Sir Thos. Wathen, Bart. 16, *Eaton-square, S.W.*
1863	2110 Wallich, George C., Esq., M.D. 11, *Earl's-terrace, Kensington, W.*
1864	Walmsley Joshua, Government Resident Agent. *Natal.*
1860	Walpole, Capt. the Hon. F., M.P. *Travellers' Club, S.W.; and Rainthorp hall, Long Stratton, Norfolk.*
1863	Walpole, Rt. Hon. Spencer, M.P. *Grafton-street, W.; and Ealing, W.*
1853	Walter, Henry Fraser, Esq. *Papplewick-hall, near Nottingham.*
1865	Walton, H. C., Esq., C.E. 26, *Savile-row, W.*
1863	Walton, J. W., Esq. 26, *Savile-row, W.*
1864	Walton, R. G., Esq., C.E.
1853	*Ward, George, Esq.

Year of Election	
1860	Ward, Admiral J. Hamilton. *Oakfield, Wimbledon-park, S.W.*
1865	2120 Ward, Swinburne, Esq., Civil Commissioner. *Seychelles Islands.*
1869	Ward, Capt. the Hon. Wm. John, R.N. *H.M. Legation, Washington. Care of the American Department, Foreign-office, S.W.*
1868	Ward, William Robert, Esq. 22, *Thurloe-square, S.W.*
1862	Wardlaw, John, Esq. 57, *Prince's-gate, Kensington, W.*
1868	Wardlaw, Col. Robert, C.B. *United Service Club, S.W.*
1864	Warner, E., Esq. 49, *Grosvenor-place, S.W.*
1859	Warre, Arthur B., Esq. 109, *Onslow-square, S.W.*
1869	Warre, Col. H. J., C.B. *United Service Club, S.W.*
1869	Warren, Charles, Esq. 17, *Hanover-street, Peckham, S.E.*
1862	Warren, Capt. Richard Pelham. *Worting-house, Basingstoke.*
1867	2130 Washbourn, B., Esq., M.D., &c. *Eastgate-house, Gloucester.*
1867	Waterhouse, George Marsden, Esq. *Care of Messrs. Morrison and Co., Philpot-lane, E.C.*
1852	Watkins, John, Esq., F.R.C.S., F.S.A. 2, *Falcon-square, Aldersgate-street, E.C.*
1862	Watney, John, Esq. 16, *London-street, Fenchurch-street, E.C.*
1859	Watson, James, Esq. 24, *Endsleigh-street, W.C.*
1860	Watson, James, Esq., Barrister-at-Law. 13, *Circus, Bath.*
1861	Watson, John Harrison, Esq. 28, *Queensborough-terrace, Kensington-gardens, W.*
1868	Watson, Robert, Esq. 32, *Inverness-road, Bayswater, W.*
1867	Watson, Robert Spence, Esq. *Moss Croft, Gateshead-on-Tyne.*
1853	Watts, J. King, Esq. *St. Ives, Huntingdonshire.*
1857	2140 *Waugh, Maj.-General Sir Andrew Scott, Bengal Engineers, F.R.S., late Surveyor-General and Superintendent Great Trig. Survey. *Athenæum Club, S.W.; and* 7, *Petersham-terrace, Queen's-gate-gardens, South Kensington, W.*
1861	Way, Arthur, Esq. *Ashton-lodge, Ashton, near Bristol.*
1868	Webb, Edward B., Esq., C.E., &c. 34, *Great George-street, S.W.*
1858	*Webb, Capt. Sydney. *Oriental Club, Hanover-square, W.; and* 24, *Manchester-square, W.*
1862	*Webb, William Frederick, Esq. *Army and Navy Club, S.W.*
1836	*Webber-Smith, Maj.-General James, 95th Regiment. 23, *Devonshire-terrace, Hyde-park, W.*
1865	Webster, Alphonsus, Esq. 44, *Mecklenburg-square, W.C.*
1864	Webster, E., Esq. *North-lodge, Ealing, W.*
1858	Webster, George, Esq., M.D. *Dulwich, S.E.*
1866	Webster, George, Esq. 40, *Finsbury-circus, E.C.*
1860	2150 Weguelin, Thomas Matthias, Esq., M.P. *Peninsular and Oriental Steam Navigation Co., Moorgate-street, E.C.*
1851	Weller, Edward, Esq. 34, *Red-lion-square, W.C.*
1853	*Wellington, Arthur Richard, Duke of, Major-General, D.C.L. *Apsley-house, W.; and Strathfieldsaye, Hampshire.*
1864	Wells, Sir Mordaunt, late Chief Puisne Judge, Bengal. 107, *Victoria-st., S.W.*
1862	Wells, William, Esq. 22, *Bruton-street, W.; and Redleaf, Penshurst, Kent.*

Year of Election.	
1863	Welman, Chas., Esq. *Norton-manor, Taunton.*
1868	Wentworth, William Charles, Esq. *Combe-lodge, Pangbourne, Berks.*
1857	West, Lieut.-Colonel J. Temple.
1861	West, Rev. W. De Lancy, D.D., Head Master, Grammar School. *Brentwood, Essex.*
1863	*Westlake, John, Esq. 16, *Oxford-square, W.*
1853	2160 Westmacott, Arthur, Esq. *Athenæum Club, S.W.*
1852	Weston, Alex. Anderdon, Esq., M.A. 18, *Rutland-gate, Hyde-park, S.W.*
1862	Westwood, John, Esq. 8 *and* 9, *Queen-street-place, Southwark-bridge, E.C.*
1863	Wetton, Champion, Esq. *Somerset-hill, Dorking.*
1830	*Weyland, John, Esq., F.R.S. *Woodrising-hall, Norfolk.*
1866	Wharncliffe, Lord. 15, *Curzon-street, W.*
1861	Wharton, Rev. J. C. *Willesden-vicarage, N.W.*
1858	Wheatley, G. W., Esq. 150, *Leadenhall-street, E.C.*
1859	Wheelwright, William Esq. *Gloucester-lodge, Regent's-park, N.W.*
1853	*Whinfield, Edward Wrey, Esq., B.A *South Elkington-vicarage, Louth.*
1839	2170 *Whishaw, James, Esq., F.S.A. *Oriental Club, W.*
1867	Whitaker, Thomas Stephen, Esq. *Everthorpe-hall, East Yorkshire; and Conservative Club, S.W.*
1868	Whitby Rev. Thomas, M.A., &c. *St. John's-terrace, Woodhouse Moor, Leeds.*
1857	White, Arthur D., Esq., M.D. 56, *Chancery-lane, W.C.*
1865	White, Lieut. Arthur Wellesley, R.A. *Kingston, Canada. Care of Capt. T. P. White,* R.E., *Ordnance Survey, Edinburgh.*
1855	*White, Charles, Esq., J.P. 10, *Lime-st., E.C.; and Barnesfield-house, Dartford, Kent.*
1857	White, Henry, Esq. 5, *Lancaster-gate, Hyde-park, W.*
1862	White, Col. Henry Dalrymple, C.B. 39, *Lowndes-square, S.W.*
1869	White, Robert Owen, Esq. *The Priory, Lewisham, S.E.*
1866	White, W. A., Esq. *Care of E. Hertslet, Esq., Foreign-office, S.W. Civil Service Club, S.W.*
1852	2180 White, William Foster, Esq. *Treasurer, St. Bartholomew's Hospital, E.C.*
1863	*White, William O., Esq. 10, *Lime-street, E.C.; and Barnsfield, near Dartford, Kent.*
1862	Whitehouse, William Matthew Mills, Esq. 46, *Chepstow-place, Bayswater, W.; and Hardwicke-house, Studley, Warwickshire.*
1862	Whitmore, William, Esq. 28, *Oxford-square, W.; and Beckenham, Kent, S.E.*
1860	Whitty, John Irwine, Esq. D.C.L., LL.D., M.A., C.E., &c. 94, *Lower Baggot-street, Dublin; Ricketstown-hall, Co. Carlow; and Providence-court, Queen's Co., Ireland.*
1865	Whymper, Edward, Esq. *Town-house, Haslemere.*
1864	Whyte, M. B., Esq. 115, *St. George's-road, S.W.*
1869	Whytt, Ebenezer, Esq. *The Grove, Highgate, N.*
1867	Wilkins, J. E., Esq. *Odessa, S. Russia. Care of T. P. Cobb, Esq.,* 9, *Craven-hill-gardens, Hyde-park, W.*
1866	Wilkinson, Alfred, Esq. 14, *Elvaston-place South Kensington, W.*

190 *Wilkinson, Major A. Eastfield, B.A. *Oudh Commission, India; 7, Cavendish-place, Brighton; and Army and Navy Club, S.W.*

Wilkinson, Frederick E., Esq., M.D. *Sydenham, Kent, S.E.*

Wilkinson, Dr. G. 4, *St. John's-wood-villas, St. John's-wood, N.W.*

Wilkinson, J. J., Esq. 31, *Springfield-road, St. John's-wood, N.W.*

*Wilkinson, Sir John Gardner, D.C.L., F.R.S. *Brynfield-house, Reynoldston, Gower, Glamorgan.*

Wilkinson, James, J. Esq.

Willcock, J. W., Esq., Q.C. 6, *Stone-buildings, Lincoln's-inn, W.C.; and Rosenstead, Avenue-road, St. John's-wood, N.W.*

Williams, Charles Henry, Esq. *Churchill-house, Churchill, Somersetshire.*

Williams, Frederick, G. A., Esq. *Chapel-stairs, Lincoln's-inn, W.C.*

Williams, Henry Jones, Esq. 10, *Hereford-street, Park-lane, W; and* 82, *King William-street, E.C.*

2200 Williams, Henry R., Esq. 183, *Camden-road, N.*

Williams, Major-General Sir Wm. F., Bart., K.C.B., D.C.L., Commander-in-Chief, Canada. *Army and Navy Club, S.W.*

Williams, W. Rhys, Esq., M.D. *Royal Bethlehem Hospital, S.*

*Williams, Michael, Esq. *Tregullow, Scorrier, Cornwall.*

*Williams, F. M., Esq. *Goonvrea, Penan, Arworthal, Cornwall.*

Willoughby, Henry W., Esq. 35, *Montagu-square, W.*

Wills, William Henry, Esq. (J. P. for city and county of Bristol). *Hawthornden, Clifton Down, Bristol.*

Wilson, Alexander, Esq. 24, *Highbury-place, N.*

Wilson, Captain Anthony. 55, *Moorgate-street, E.C.; and* 11, *Chepstow-villas, Bayswater, W.*

Wilson, Capt. Charles William, R.E. 4, *New-street, Spring-gardens, S.W.*

2210 Wilson, E., Esq. *Hayes-place, Bromley, Kent.*

Wilson, Capt. J. C., R.N. *Care of Messrs. Woodhead and Co.*

*Wilson, Robert Dobie, Esq. 15, *Green-street, Grosvenor-square, W.*

Wilson, Samuel King, Esq. 3, *Portland-terrace, Regent's-park, N.W.*

Wilson, Rev. T. Given, B.A. *The Parsonage, Halstead, Essex.*

Wilson, Captain Thomas, R.N.

Wilson, Thomas, Esq. 3, *St. George's-villas, Cricketfield-road, Lower Clapton, N.E.*

Wiltshire, Rev. Thomas, M.A., F.G.S., F.L.S. 13, *Granville-park, Lewisham, S.E.*

*Winch, W. Richard, Esq. *Chislehurst, Kent.*

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Cornwall, 65 sheets; Devon, 12 sheets; Essex, 160 sheets; Glamorgan, 26 sheets; Hampshire, 412 sheets; Hertfordshire, 5 sheets; Kent, 558 sheets; Middlesex, 6 sheets; Suffolk, 13 sheets; Surrey, 210 sheets.

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Aberdeen, 440 sheets; Argyle, 211 sheets; Banff, 182 sheets; Elgin, 38 sheets; Inverness, 12 sheets.

Ireland—

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ORDNANCE MAPS—5 and 10-feet scales (Towns)—

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Aberdare, 20 sheets; Dartford, 9 sheets; Faversham, 12 sheets; Lymington, 9 sheets.

Scotland—

Campbelton, 13 sheets; Oban, 18 sheets.

Total .. .. 2597 sheets of Ordnance Survey.

The ORDNANCE SURVEY OFFICE, SOUTHAMPTON.
Through Sir H. James, R.E., Director.

London.—A new Map of Metropolitan Railways and Miscellaneous Improvements deposited at the Private Bill Office, Nov. 30th, 1868, for Session 1869. Scale 1 inch = $\frac{1}{2}$ mile (stat.) By Edward Stanford. London, 1869 .. .. The AUTHOR.

Map showing How to Travel in and around London by Railway. M. Vigers. London. For March, 1869. Scale 1 inch = $1\frac{3}{4}$ mile. (geo.) .. .. PURCHASED.

Map of Ireland to accompany the Report of the Land Tenure Commissioners, 1845. Showing the Places visited by the Commissioners and the relative proportion of the Surface of each Country lying between certain lines of Altitude. Scale 1 inch = 10 miles (stat.)
Sir R. I. MURCHISO

FRANCE—

Carte Lithologique des Mers de France exécutée d'après les travaux hydrographiques. Par M. Delesse. Paris, 1869. Scale 1 inch = 27 miles (geo.) .. .. Sir R. I. MURCHISON.

GERMANY—

Austria—

Karta Coro-orografica, Politica, Statistica, Geognostica, Botanica e Zoologica del Circolo di Trento. On 12 sheets. Sheet 1 only supplied. Scale 1 inch = 1 mile (geo.) By Prof. F. Masera. 3 copies.
Professor F. MASERA.

Maps, Charts, &c. *Donors.*

Originalkarte der südlichen Ortler Alpen. Von Julius Payer. Justus Perthes. Gotha, 1869. .. .. .. **A. Petermann, Esq.**

BAVARIA—

Four sheets of the Government Map of Bavaria, viz.:—
No. 85. Traunstein.
„ 92. Auerburg.
„ 93. Reichenhall.
„ 94. Berchtesgaden.
Scale 1$\frac{1}{10}$ inch = 1 mile (geo.).
Sir R. I. Murchison.

PRUSSIA—

Historische Wandkarte von Preussen zur Uebersicht der territorialen Entwickelung des Brandenburg-Preussischen Staates von 1415 bis jetzt. Von Dr. A. Brecher. On 9 sheets. Scale 1 inch = 10½ miles (geo.). Berlin, 1869 .. .. **Purchased.**

GREECE—

Neuer Atlas von Hellas und den Hellenischen Colonien, in 15 Blättern. Bearbeitet von H. Kiepert. Berlin, 1868. Part 1st, containing 5 sheets. **Dr. H. Kiepert.**

ITALY—

Italia di Matteo Greuter. Nuonuamente Ristampata, Riuista et Augumentata da Domenico de Rossi Heredi di Gio Giocomo de Rossi. Rome, 1695. Scale 1 inch = 7½ miles (geo.). **Charles P. Schaiffer, Esq.**

RUSSIA—

Karte des nördlichen Ural und des Küstengebirges Pae-Choi, entworfen nach Aufnahmen und astronomischen Ortsbestimmungen, ausgeführt auf der durch die Kaierlichs Russische geographische Gesellschaft ausgerüsteten Ural-Expedition in den Jahren 1847, 1848, und 1850. On 2 sheets. Scale 1 inch = 15 miles (geo.). **Sir R. I. Murchison.**

SWEDEN—

Sveriges Geologiska Undersökning på offentlig bekostnad utförd under-ledning af A. Erdmann. 9 sheets, viz.:—
Sheet 22. Eriksberg.
„ 23. Nyköping.
„ 24. Tärna.
„ 25. Sämsholm.
„ 26. Sala.
„ 27. Rånäs.
„ 28. Borås.
„ 29. Leufsta.
„ 30. Eggegrund.
Scale 1 inch = 0·68 mile (geo.). With 9 books of letterpress.
Geological Society of Sweden.

TURKEY—

Die Europäische Türkei. Von A. Petermann. Gotha, 1868. Scale 1 inch = 34 miles (geo.) .. .. **The Author.**

Esquisse de l'Herzégovine et du Montenégro. Extraite des meilleurs documents par H. B^{n}. de Beaumont. 1861. 'Revue et corrigée par A. Boué. Scale 1 inch = 24 miles (geo.). J. Wurster and Co. Winterthur. **Sir R. I. Murchison.**

ASIA.

CENTRAL—

MS. Map of the Country between Kashgar, Koondooz, Yarkand and Peshawar. By G. W. Hayward. 1868. Scale 1 inch = 2 miles (geo.). **The Author.**

Maps, Charts, &c. *Donors.*

CHINESE EMPIRE—

A large Chinese Map of China. 32 parts in a cloth case.
Chinese Map of China. Mr. J. S. Coysh.
Chinese Map of the City of Pekin .. Lavington Oxenham, Esq., Student Interpreter. Pekin, 1868.

Plan of the Tsien-Tang River, from Hangchow-Foo to Kiuchow-Foo. November, 1867. On 5 sheets. Scale 1 inch = 1 mile (geo.). Mr. Elias.

MS. Map of Manchuria founded upon Admiralty Charts and D'Anville's Map. Scale 1 inch = 11½ miles (geo.). By Mr. A. Williamson. 1868. The Author.

Map showing the Route Survey from Nepal to Lhasa, and thence through the Upper Valley of the Brahmaputra. Made by Pundit ——. From the Map compiled by T. G. Montgomerie, R.E. Scale 1 inch = 27½ miles (geo.). 2 copies. E. Weller. London, 1869. E. Weller, Esq.

Upper Basins of the Indus and Sutlej Rivers, with the Sources of the Brahmaputra and Kurnali Rivers, from Route Surveys made by the Pundit Explorers. Compiled by Capt. T. G. Montgomerie. Dehra Doon, 1868. Scale 1 inch = 15 miles (geo.). Sir R. I. Murchison.

Forschungen und Aufnahmen zweier Punditen (Indischer Eingebornen) in Tibet, am Nari-tschu Sangpo oder obern Brahmaputra in Nepal und dem Himalaya, 1865-67. Auf Grund der Karten und Berichte v. Capt. T. G. Montgomerie, mit Zusätzen von A. Petermann. Gotha, 1868. Scale 1 inch = 27½ miles (geo.) .. .. A. Petermann, Esq.

Reise Indischer Geodaten nach den Goldfeldern von Tibet, 1867. Scale 1 inch = 27½ miles (geo.). Von A. Petermann. Gotha, 1869. The Author.

INDIA—

Map of India in 1868. By E. Weller. London, 1868. Scale 1 inch = 130 miles (geo.) .. .. The Author.

Map of proposed Railway Communication between India, Burmah, and China. Scale 1 inch = 60 miles (geo.).

Chota Nagpore Topographical Survey. Sheets 18, 28, 30, 37, 38, 41, 46. 47, 48, 49, 50, 54½, and Index. Scale 1 inch = 0·86 mile (geo.). Calcutta, 1867-68.

Cossyah and Garrow Hill District. Sheet 16-17. Scale 1 inch = 1·72 miles (geo.) Calcutta, 1867.

Cossyah and Garrow Hills Topographical Survey. Sheets, 15 and 16 Scale 1 inch = 0·68 mile (geo.). Calcutta, 1867 and 1868.

Ganjam and Orissa Topographical Survey. Sheets 1, 2, 3, 4, 5, 6, 7, an 8. Scale 1 inch = 0·68 mile (geo.). Calcutta, 1867.

Ganjam and Orissa Topographical Survey. Sheets 1, 2, 3, and 6. Scale 1 inch = 0·68 miles (geo.). Calcutta, 1868.

Gwalior and Central India Topographical Survey. Sheets 8½, 12, 13, 14, 16, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, and index. Scale 1 inch = 0·68 miles (geo.). Calcutta, 1867-1868.

Gwalior Topographical Survey. Parts of Jeypoor and Tonk States. Scale 1 inch = 3½ miles (geo.). Calcutta, 1868.

Gwalior Topographical Survey. Nursingphoor District. Scale 1 inch = 3½ miles (geo.). Calcutta, 1867.

Lower Provinces Revenue Survey. Darjeeling District, Purgunnah Hattigheesa and Patturghatta. On 4 sheets. Scale 1 inch = 1·72 mile (geo.). Calcutta, 1866.

Maps, Charts, &c. *Donors.*

Lower Provinces Revenue Survey. Darjeeling District, Daling Subdivision, Main Circuit, No. 1. On 2 sheets. Scale 1 inch = 1·72 mile (geo.). Calcutta, 1868.

Lower Provinces Revenue Survey. Darjeeling District, Daling Subdivision. Main Circuit, Nos. 2 and 3. On 2 sheets. Scale 1 inch = 72 miles (geo.). Calcutta, 1861.

Lower Provinces Revenue Survey. Darjeeling District, Hill Territory of British Sikkim. On 5 sheets. Scale 1 inch = 1·72 mile (geo.). Calcutta, 1867.

Lower Provinces Revenue Survey. Tipperah District. On 11 sheets. Scale 1 inch = 0·68 mile (geo.). Calcutta, 1866-7-8.

Rajpootana Topographical Survey. Sheets 1, 6, 11, 12, 13, 14, 17, 18, 19, and 23. Scale 1 inch = 0·68 mile (geo.). Calcutta, 1868.

Rajpootana Topographical Survey. Parts of Jeypoor and Jodhpoor. Scale 1 inch = 3½ miles (geo.). Calcutta, 1868.

Rampoor Jageer Territory. Scale 1 inch = 3½ miles (geo.) Calcutta, 1867.

Rewah Topographical Survey. Sheets 5, 6, 7, 8, 9, 11, 14, 17, 19, 32, 36, and index. Scale 1 inch = 0·68 mile (geo.). Calcutta, 1866-7-8.
The India Office,
through C. R. Markham, Esq.

Map illustrating the Routes taken by Mr. Johnson, Civil Assistant, G. T. Survey, in travelling from Leh to Khotan and back, in 1865. Scale 1 inch = 13¾ miles (geo.).

Japan—

Descriptive Map showing the Treaty-limits round Yokohama, including the Province of Sagami and portions of Kai, Idzu, Musasi, and Suraga. Compiled and drawn by Lieut. A. G. S. Hawes, R.M.L.I., 1865-1867. James Wyld, 1868. Scale 1 inch = 2 miles (geo.). James Wyld, Esq.

Persia—

Map of Aderbeijan, compiled principally from personal observations and surveys made in the years 1851-1855. By N. Khanikoff, and based upon all the points hitherto determined, principally the Astronomical Observations of Mr. Lemm and the Caucasian Triangulation. Scale 1 inch = 11 miles (geo.). By H. Kiepert. Berlin, 1862.
Sir R. I. Murchison.

Russia—

Die neue administrative Eintheilung Kaukasiens und Route der Ersteigung des Elbrus und Kasbek durch Freshfield, Moore, und Tucker. Juni-Aug. 1868. Scale 1 inch = 51 miles (geo.). Von A. Petermann. Gotha, 1869 .. .. A. Petermann, Esq.

Outline Map of the Caucasus, on tracing paper. Scale 1 inch = 12 miles (geo.). .. .. Mr. Spottiswoode.

Siam—

Gulf of Siam, with adjacent Districts in Laos and Cambodia, to illustrate the Expeditions of Messrs. Kennedy and Thomson, in the years 1855 and 1866. (*MS.*) Scale 1 inch = 25 miles (geo.).

Turkestan—

Turkestan with the adjoining portions of the British and Russian Territories. Surveyed on the basis of the Surveys made by British and Russian Officers up to 1867, and on recent Itineraries. Compiled and zincographed under the orders of Lieut.-Col. J. T. Walker, R.E., F.R.S. Dehra Doon 1868. On 4 sheets. Scale 1 inch = 29 miles (geo.).
The India Office,
through C. R. Markham, Esq.

Maps, Charts, &c. *Donors.*

Map of Turkestan. Scale 1 inch = 60 miles (geo.), in Russian character. 1867.

The Caspian Sea, Khiva, and the surrounding country Scale 1 inch = 40 miles (geo.). By J. Arrowsmith. London, 1841.

Entwurf des Kriegstheaters Russlands gegen Chiwa. Von Carl Zimmermann. Berlin, 1840. Scale 1 inch = 48 miles (geo.).
Sir R. I. MURCHISON.

TURKEY—

Kleinasien und Syrien, nebst den westlichen Theilen von Armenien, Kurdistan und Mesopotamien. Scale 1 inch = 51 miles. (geo.). By A. Petermann. Gotha, 1868.

Palästina. Scale 1 inch = 17 miles (geo.). Von A. Petermann. Gotha, 1868 .. .. The AUTHOR.

Map of Routes to illustrate Journal of a Tour in Armenia, Koordistan, including the Deyrsim Dagh and Northern Mesopotamia, performed in 1866 by W. Taylor, H. M. Consul for Koordistan. Scale 1 inch = 8 miles (geo.). (*MS.*) .. .. The AUTHOR.

AFRICA.

NORTHERN—

Map to accompany Gerhard Rohlfs' Narrative of his last Journey. By A. Petermann. Gotha, 1868. Scale 1 inch = 48 miles (geo.).

Originalkarte zur Uebersicht von G. Rohlfs' Reisen in Tripolitanien und Fessan, 1864 & 1865. Scale 1 inch = 48 miles (geo.). Von Augustus Petermann. Gotha, 1868. .. .. .. A. PETERMANN, Esq.

Originalkarte zur Uebersicht von Gerhard Rohlfs' Reise durch die grosse Wüste (Sahara) von Murzuk nach Kuka, März-Juli 1866, und seiner Forschungen über Tibesti. Scale 1 inch = 48 miles (geo.). Von A. Petermann. Gotha, 1868. .. .. A. PETERMANN, Esq.

EASTERN—

Map of Abyssinia, showing the Route of the British Mission to King Theodore round that country, from Massowah to Magdala, and back to Annesley Bay. Scale 1 inch = 19½ miles (geo.). Compiled from Mr. H. Rassam's data by G. P. Badger. London, 1869.
G. P. BADGER, Esq.

Specialkarte von Nord-Abessinien. Von A. Petermann. Gotha, 1867. Scale 1 inch = 14 miles (geo.).

Specialkarte des Nordabessinischen Gebirgslandes zwischen Massua und Halay. Von A. Petermann. Gotha, 1867. Scale 1 inch = 4½ miles (geo.). .. .. The AUTHOR.

Line of March of the British Army under Lieut.-Gen. Lord Napier of Magdala, 1868. Surveyed by Lieut. Carter, R.E., and Assistants. Drawn by Lieut. Holdich, R.E. Published at the Ordnance Survey Office, Southampton, 1869. On 5 sheets. Scale 1 inch = 3½ miles (geo.).
ORDNANCE SURVEY OFFICE, SOUTHAMPTON,
through Sir H. James, R.E., Director.

Karte der Englischen Aufnahmen in Abessinien, 1867 und 1868. Auf Grund der v. Engl. Kriegsminist. Febr. 1869 herausgegebenen 5 Blätt. Karte der Aufnahmen des Vermessungs-Corps unter Carter, Dummler und Holdich, mit Benutzung der Messungen und Arbeiten von Markham, offiz. Geographen der Expedition, der Aufnahmen des General-Quartiermeisters Phayre u. A. On 2 sheets. Scale 1 inch = 6 miles (geo.). Von A. Petermann. Gotha, 1869 .. A. PETERMANN, Esq.

Maps, Charts, &c. *Donors.*

Map showing Mr. Munzinger's Track from Ras Amphila to the Afar Country. Scale 1 inch = 10 miles (geo.).

Sketch of the Road to Kayahkor. March 1st, 1867. By W. Munzinger. Scale 1 inch = 4 miles (geo.) .. .. .. E. WELLER, Esq.

MS. Map of a Route from Metemmeh to Aschfa, including the Country West of Lake Tsana. By Dr. H. Blanc. Scale 1 inch = 10 miles (geo.). .. .. The AUTHOR.

Das Nil-Quellgebiet und die äquatorialen Seen Afrikas, nebst Uebersicht der Reisen von Carlo Piaggia, 1860-65, und der neuesten Nachrichten von Ambroise und Jules Poncet, 1868. Scale 1 inch = 110 miles (geo.). Von A. Petermann. Gotha, 1868.

Originalkarte des Gebietes der südlichen Galla- und Waboni- nebst den angrenzenden Somali-Ländern. Nach seinen Reisen in 1866 und 1867 von R. Brenner. Scale 1 inch = 35 miles (geo.). By A. Petermann. Gotha, 1868 .. .. A. PETERMANN, Esq.

SOUTHERN—

Südafrika und Madagaskar. Von A. Petermann. Gotha, 1868. Scale 1 inch = 174 miles (geo.) .. .. The AUTHOR.

Map of South-Eastern Africa, showing the Routes to the Victoria Gold Fields. Scale 1 inch = 56½ miles (geo.). By Richard Vause. Natal Mercury, 1868. 2 copies .. .. .. The AUTHOR.

Original Map of the South African Republic, from Surveys and Observations by Surveyor-General M. Forssmann, C. Mauch, F. Hammar, Surveyor J. Brooks, and other official documents, combined with the results of their own explorations by F. Jeppe and A. Merensky. Potchefstroom and Botsabelo, 1868. Scale 1 inch = 25 miles (geo.). Reconstructed and augmented with data from various exploring travellers. By A. Petermann. Gotha, 1868 .. .. .. A. PETERMANN, Esq.

AMERICA.

NORTH—

Arctic—

Chart showing the North-West Passage discovered by H.M.S. *Investigator*, also the coast explored in Search of Sir J. Franklin. By E. A. Inglefield Commander H.M.S. *Phœnix*. Scale 1 inch = 50 miles (geo.). Hydrographic Office. London, 1853.

Discoveries in the Arctic Sea between Baffin Bay, Melville Island, and Cape Bathurst; showing the coasts explored on the ice by Capt. Ommaney and the Officers of the Expeditions under the command of Capt. H. T. Austin, R.N., C.B., and Capt. W. Penny; also by the Honourable Hudson's Bay Company's Expedition, under the command of Rear-Admiral Sir John Ross, C.B., and Dr. John Rae, in Wollaston and Victoria Land, in Search of Sir John Franklin, 1850-51. Scale 1 inch = 32 miles (geo.). By John Arrowsmith. London, 1852.

Discoveries of the Searching Expeditions under the command of H. T. Austin, R.N., C.B., and Capt. Penny, 1851. Scale 1 inch = 25 miles (geo.). Hydrographic Office. London, 1851.

Chart of Melville Island and Prince Patrick Land, showing the Explorations of Captains M'Clintock and Meecham. Scale 1 inch = 20 miles (geo.). (*MS.*) .. .. Sir R. I. MURCHISON.

Plan and View of Wrangell's Land, as seen from the Barque *Nile*, August 15 and 16, 1867, from 15 to 20 miles distant. Scale 1 inch = 30 miles (geo.). (*MS.*) .. .. Capt. LONG, of the American Whaler *Nile*.

Wrangel-Land und Uebersicht der Entdeckungsgeschichte im Eismeer nördl. der Behringstrasse, 1648-1867. Scale 1 inch = 70 miles (geo.). Von A. Petermann. Gotha, 1869 .. .. .. The AUTHOR.

Maps, Charts, &c. *Donors.*

British—

Originalkarte von Vancouver-Insel, zur Uebersicht der Aufnahmen und Forschungen des Innern durch die officiellen Expeditionen unter dem Befehl von Robert Brown, 1863-1866. Von A. Petermann. Gotha, 1869. Scale 1 inch = 18 miles (geo.) .. .. A. PETERMANN, Esq.

NITED STATES—

Map of California and Nevada. By H. H. Bancroft and Co. San Francisco, 1868. Scale 1 inch = 21 miles (geo.) .. W. LANE BOOKER, H.B.M. Consul, San Francisco.

Originalkarte der Californischen Halbinsel nach den Aufnahmen der für die Lower California Company ausgeführten Expedition unter J. Ross, Browne, W. M. Gabb und F. Loehr. Mit Benutzung der Küstenaufnahmen v. Capt. C. M. Scammon, zusammengestellt von F. Loehr. Scale 1 inch = 48 miles (geo.). A. Petermann. Gotha, 1868. A. PETERMANN, Esq.

ENTRAL—

Carte d'étude pour le tracé et le profil du Canal de Nicaragua, par Thomé de Gamond, Ingénieur Civil, précédée de Documents publiés sur cette question par M. Félix Belly. Paris, 1858. Sir R. I. MURCHISON.

OUTH—

General—

South America, showing its rivers. Scale 1 inch = 6°. T. J. HUTCHINSON, Esq., H.M. Consul at Rosario.

Argentine Republic—

Republica Argentina. Par Nicolas Grondona, 1863. Scale 1 inch = 63 miles (geo.).

Mapa de la Republica Argentina mostrando la Linea del Ferro-Carril proyectado entre el Rio Parana y Cordova. Compilado del de Sir W. Parish y otros recursos Allan y Alex. Campbell, 1855. Scale 1 inch = 46 miles (geo.).

Carta para intelligencia del informe sobre fronteras presentado al Exmo. Gobierno-Nacional por el General Don Wenceslao Paunero, Buenos Ayres, 1864. Scale 1 inch = 45 miles (geo.).

Carta postal de la Republica Argentina levantada por orden de la Direccion General de Correos. Scale 1 inch = 41 miles (geo.).

Map of the Southern portion of the Argentine Republic. Comprising the Territory conceded by the Government of the Province of Cordova, the Colonies already established in the Republic, and the most remarkable passes in the Andes communicating with Chili. Smith and Son. London, 1864. Scale 1 inch = 47 miles (geo.).

Carta Esferica de la Confederacion Argentina y de las Republicas del Uruguay y del Paraguay. Construida oficiosamente en 1802 por el Segundo Comisario y Geografo de la sobre dicha Segunda Subdivision Española Don José Maria Cabrer, para desatar las dudas ocurridas entre los referidos Gefes, y que ambas Cortes pudiesen deliberar sobre la importante obre de Limitos. Paris, 1853. Scale 1 inch = 29 miles (geo.).

Plano del Rio y Territorio Paraguayo de operó la escuadra y el ejército Brasilero 18 y 19 de Febrero.

Carta Geografica de la República Oriental del Uruguay por el General de Ingenieros Don José Maria Reyes. Paris. Scale 1 inch = 9⅓ miles (geo.).

Mapa de la República Oriental del Uruguay. Hecha para el uso de las escuelas del Estada por T. G. Scale 1 inch = 45 miles (geo.).

Maps, Charts, &c. *Donors.*

Servicio de Correos de la República Oriental del Uruguay. Presentado al Exm° Gobierno Provisorio por el Administrador General del Ramo. A. Gutierrez. Montevideo, 1865.

Registro grafico de las propiedades rurales de la Provincia de Buenos Aires, construido por el departamento topografico, gravado por Julio Vigier y publicado con autorizacion del Superior Gobierno de la Provincia, 1864. Saturnino Salas, Mariano Moreno, German Kuhr, Pedro Benoit, Ygnacio Casagemas, Antonio E. Malaver. On 6 sheets, mounted in one. Scale 1 inch = 6 miles (geo.).

Another copy, mounted on rollers, presented by P. F. Torromé, Esq.

Provincia de Buenos Aires. Scale 1 inch = 10½ miles (geo.). Por John Arrowsmith. London, 1836.

Plano Catastral Provincia Cordoba departamento Union.

Carta Geografica de la Provincia de Corrientes y parte de Republica del Paraguay, construido con los datos que existen en los Archivos del departamento topografico de Buenos Aires, y teniendo presente todos las cartas publicadas hasta la fecha. 1865. Scale 1 inch = 11¾ miles (geo.).

Torrenos recorridos por el C. B. Bossi en su esploracion a la Provincia de Mato Grosso en 1862. MS. Scale 1 inch = 28¼ miles (geo.).

Provincia de Santa-Fé, without Title, Name, or Date.

Mapa de la Provincia de Santa-Fé. Para los Immigrantes. Por W. P. 1867. Scale 1 inch = 20 miles (geo.).

Santa-Fé y sus Colonias.

Plano topografico del territorio comprendido entre Fortin Mercedes, el Pueblo del Pergamino, el Arroyo de Ramallo, el Rio Parana con los Pueblos de Sn. Nicolos de Arroyos en el estado de Buenos Aires; y la Ciudad del Rosario, el Rio Carcarana y el Fortin de la India Muerta en la Provincia de Santa-Fé. Scale 1 inch = 5 miles (geo.).

Plano topografico de los terrenos situados al Nor-oeste de la Provincia de Santa-Fé. Cedidos por el Gobierno de esta Provincia á la Nacion para indemnizar á los propietarios espropiados por el Ferro-Carril Central Argentino, levantado en Diciembre de 1864, y en Enero y Feb.

Plano de los terrenos medidos en la Provincia de Santa-Fé, departamento de la Capital y S. Geronimo, para la Comision encargada de la espropiacion de Tierras para el Ferro-Carril Central Argentino. 1866. Reducido del original presentado por D. Gaetano Liví, M. G. Sanches.

Plano del Rio Bermejo desde sus cabezeras hasta su desague en el del Paraguay, navegado e reconocido en 1826 por el Ciudno Pablo Soria, Miembro de una Sociedad formada á este objeto bajo el nombre de Compañia del Bermejo. Octubre 10, 1831. Scale 1 inch = 18 miles (geo.). Buenos Ayres.

Plans of the River Clyde at the Port of Glasgow and the Harbour of Ensenada, showing their comparative width and depth of water and accommodation for commerce. Scale 6 inches = 1 mile (geo.).

Mapa do Rio Grande do Sul. Por L. Zambeccari. Scale 1 inch = 17½ miles (geo.).

Mapa de la costa del Parana entre San Javier y El Rey, compilado de la mensura de Don Toribio Aguirre, y las esploraciones de la Espedicion á El Rey. Bajo los Auspicios del Exmo. S^{or} Gobernador de Santa-Fé, Don Nicasio Oroño, por Don Guillermo Perkins, F.R.G.S., Secretario de la Comision de Immigracion en el Rosario, y Jefe de la Espedicion. 1866.

Colonies of Esperanza, San Geronimo, and San Carlos. MS. Scale 1 inch = 18 miles (geo.).

Maps, Charts, &c. *Donors.*

Plano topografico del Paso de La Patria á Humayta. Levantado sobre documentos autenticos. Abril de 1866.

Carte générale du bassin de la Plata, dressée d'après des documents recueillis sur les lieux et les meilleurs plans partiels de cette contrée. Par M. Coffinières Lt.-Col. du Génie. Scale 1 inch = 8¾ miles (geo.). Montevideo, 1850.

A map of the Delta of the River Parana. By Edward Stanford. London, 1865. Scale 1 inch = 5 miles (geo.).

Plan of the Junction of the Rio Parana and Rio Paraguay.

Croquis del Rio Parana, arriba de las Tres Bocas Islas del mismo, y posicion de la escuadra en los dias 16, 17 y 18 de Abril de 1866.

Planta Hydrografica do Passo da Patria, incluindo o canal privado dos Parayuagos e uma parte do Rio Paraguay desde as Tres-Bôcas até á lagôa Serena ou Sirena; com as posições da Esquadra Imperial Brasileira nos combates de Março e Abril de 1866 levantada por ordem do Illm. e. Exm. Sr. Vice Almirante. Por Visconde de Tamandaré. Rio Janeiro, 1866.

Compamento General del Paso de la Patria.

Plano del combate naval del Riachuelo entre las escuadras Brasilera y Paraguaya, el dia 11 de Junio de 1865 en el Rio Parana, 2 leguas abajo de Corrientes. Levantado por un testigo ocular. E. Coni.

Plano del Rincon de las Gallinas y terrenos adjacentes entre los Rios Uruguay y Rio Negro. Editado de Liebig's Extract of Meat Company (limited), 1868.

Trayecto del Ferro-Carril Central Argentino del Rosario de Santa-Fé á la Ciudad de Cordoba. Plano de los torrenos concedidos á la Empresa por ley nacional el 26 de Mayo de 1863, por el Ingeniero Albano M. de Laberge, 1867.

Terrenos mensurados para la Comision de Espropiacion de Tierras de Ferro-Carril Central Argentino. MS.

Plano de los terrenos cedidos para la Espropiacion de los del Ferro-Carril Central Argentino (Provincia de Santa-Fé) W. P.

Plano topografico de la Colonia Agricola La Paz situado en el Rosario Oriental Uruguay, hecho por el agrimensor del Estado, Julio Grasser, 1863.

Plano del Terreno que se destina para Pueblo en el Puerto de Fray Bentos situado sobre la costa del Uruguay en el Rincon de los Gallinas. Departamento de Paysandú, levantado por Guillermo Hammett.

Plano de las Tierras de Diego Tapia.

Map of the Gran Chaco. (*MS.*) Scale 1 inch = 2½ miles (geo.). By Guillermo Perkins.

Carta de la seccion austral del Gran Chaco con el curso detallado del Rio Bermejo. Segun los diarios de la compaña del Gobernador Matorras en 1774, y del viage por agua del Coronel Cornejo en 1790. Scale 1 inch = 29 miles (geo.). Par J. Arenales. Buenos Aires, 1832.

Plano de la Frontera del Sud tel como existia el año de 1792. (*MS.*)

Ten Plans of the Harbour of San Pedro.

Plano topografico de la Ciudad de Buenos Aires y de todo su municipio, incluyendo parte de los partidos de belgrano San José de Flores y Barracas al Sur. Levantado por el Departamento Topografico y publicado con autorizacion del Superior Gobierno de la Provincia, 1867. Saturnino Salas,—German Kuhr,—Pedro Benoit,—Ygnacio Casagemas,—Antonio E. Malaver. On 4 sheets. 3 copies.

J. J. HUTCHINSON, Esq., H.B.M. Consul, Rosario.

Another copy, mounted on rollers, presented by .. P. F. TORROMÉ, Esq.

Maps, Charts, &c. *Donors.*

Brazil—

Nova Carta Chorographica do Imperio do Brazil. Reduzida pelo Bacharel Pedro Torquato Xr. de Brito Tenente Coronel Gro do Corpo d'Engenheiros e Socio effectivo do Instituto Polytechnico Brasileiro da que foi confeccionada pelo Coronel Conrado Jacob de Niemeyer e outros Officiaes Engenheiros em 1856. Published April, 1867. Scale 1 inch = 100 miles (geo.).

Chile—

Tornada de una Carta incompleta de la Costa de Chile á bordo del buque de S.M.B. *Beagle*, 1835. Scale 1 inch = 8½ miles (geo.).

New Granada—

Mapa de la Republica de la Nueva Granada. Dedicado al Baron de Humboldt por Coronel de Artilleria Joaquin Acosta, 1847. Scale 1 inch = 2 miles (geo.) .. .. Sir R. I. Murchison.

Plano de la Provincia del Darien del Sud. Communicado por su Gobernador que fué Don Andres de Ariza, 1774. (Facsimile, with descriptive letterpress.)

Mapa que representa la parte del Darien entre Caledonia i el Golfo del San Miguel para demostrar las rutas, del Sr. Prevost comand^{te} del vapor *Virago* de teniente Strain de la Marina de los Estados Unidos, de los Señores Gisborne i St. John, el primero ingeniero civil que propuso el Canal interoceanico, i el Segundo, teniente del Real Cuerpo de Ingenieros Britanicos formado por Agustin Codazzi, 1854. Scale 1 inch = 5 miles (geo.). With descriptive letterpress.

Plano topografico de una porcion del Istmo del Darien. Mostrando el sitio de la navegacion interoceanico que se propone, Agosto 1852, Lionel Gisborne, Ingeniero Civil. Scale 1 inch = 8 miles (geo.).

M. Lucien de Puydt.

Peru—

MS. Map of the Rivers Apurimac and Mantaro. By Don Antonio Raimondi. Scale 1 inch = 2½ miles (geo.) .. .. .. The Author.

Mapa del curso de los rios de S. Gavan y Esquilaya de la Provincia de Carabaya en el Peru. Scale 1 inch = 4 miles (geo.). By Antonio Raimondi. Lima, 1866 .. .. The Author.

AUSTRALIA.

General—

Australien. Uebersicht des Standpunktes der geographischen Kenntniss von Australien, 1868, und Dr. Neumayer's Projekt zur wissenschaftlichen Erforschung Central-Australiens. Scale 1 inch = 135 miles (geo.). Von A. Petermann. Gotha, 1868 .. .. A. Petermann, Esq.

Central—

Northern Sheet of the Plan. Discoveries by John McDouall Stuart, showing his Route across the Centre of the Continent of Australia, with alterations and additions to December, 1862. Scale 1 inch = 13 miles (geo.) .. .. Wm. Finke, Esq.

Eastern—

Map to illustrate the Climate and Physical Geography of North-East Australia. Scale 1 inch = 12°. By Dr. Rattray, 1868. (*MS.*)

The Author.

Photograph of a Model of Victoria. Scale 1 inch = 25 miles (stat.). Published at the Crown Lands Office, Melbourne, 1868.

Ch. D. Liger, Esq.,
Surveyor-General of Victoria.

Maps, Charts, &c. *Donors.*

Map showing the various Trial Lines surveyed for the projected Railways in Victoria, 1855-6. By G. C. Darbyshire, C.E. Scale 1 inch = 2 miles (geo.). Surveyor-General's Office, Melbourne, 1856.
Sir R. I. MURCHISON.

Plan of Ballaarat Gold Field, showing position of the Estate of the Winter's Freehold Gold Mining Company. Scale 1 inch = 23 chains.
CH. D. LIGER, Esq.,
Surveyor-General of Victoria.

OCEANS.

ATLANTIC—

Carte Physique de l'île de Ténériffe. Par Léopold de Buch, 1814. Scale 1 inch = 1¾ miles (geo.) .. .. .. Sir R. I. MURCHISON.

PACIFIC—

Polynesien und der Grosse Ocean. Scale 1 inch = 560 miles (geo.). On 2 sheets. Von A. Petermann. Gotha, 1868.

Die Viti- oder Fiji-Inseln im Maassstabe von $\frac{1}{1500000}$ oder 1 zoll = 20½ Meilen (geog.). Hauptsächlich nach Wilkes' und Denham's Aufnahmen, 1840 und 1857. Von A. Petermann. Gotha, 1869.
A. PETERMANN, Esq.

CHARTS.

BRITISH ADMIRALTY—

Section 1.

No. 62, 62a, 62b Jersey Island (Channel Islands).
102 Pakefield Gatway to Orfordness (England, East Coast).
1169 Liverpool Bay (England, West Coast).
1825a Irish Channel (North Sheet).
1825b ——————— (South Sheet).
2045 The Owers to Christchurch (England, South Coast).
2159 Frith of Clyde (Scotland, West Coast).

Section 2.

No. 2339 The North Sea (General Chart).

Section 3.

No. 2302 Gulf of Bothnia (Sheet 8) Baltic.

Section 5.

No. 142 Strait of Gibraltar (Mediterranean).
157 San Remo to Cape Cavallo (Italy, West Coast).
165 Sardinia to Malta, including Sicily.
181 Port Augusta (Sicily, East Coast).
1492 Brindisi Harbour (Sicily, East Coast).
2206 Odessa Bay (Black Sea).
2554 Leghorn (Livorno), Italy, West Coast.
2712 Porto Rogosnizza to Ragusa Vecchia (Dalmatia).
2718a Mediterranean Sea (Western Sheet).
2718b ——————— (Central do.).

Section 6.

No. 297 Carbonear to Brigus Bay (Newfoundland, East Coast).

Section 8.

No. 106 Virgin Islands (West Sheet), West Indies.
106a ——————— (Central Sheet), do. do.
106b ——————— (East Sheet), do. do.
130 Anguilla to Puerto Rico (West Indies).
254 Montserrat Island, do. do.
484 Sombrero Island, do. do.

Charts, &c. *Donors.*

Section 9.

No. 528 South America (East Coast), Sheet 4.
534 Cayenne River Entrance (Guiana).
535 San Marcos or Maranham Bay (Brazil).
545 Harbours and Anchorages in Magellan Strait.

Section 10.

No. 229 St. Pinos to Bodega Head (California).
1923*a* 1923*b* Cape Caution to Port Simpson (British Columbia).

Section 11.

No. 598 Africa (General), Sheet 6.
734 Suez Bay (Red Sea).

Section 12.

No. 1366 Penang Island (Malacca Strait).
2056 Sunda Strait and its Approaches.
2403 Singapore Strait (China Sea).

Section 13.

No. 389 Shanghai Harbour (China, East Coast).
536 Sado Island and Approaches to Japan.
930 Plans of Anchorages in the Moluccas.
931 Plans of Anchorages in the Celebes.
934 Sourabaya Strait, &c. (Eastern Archipelago).
935 Harbours and Anchorages between Baly and Timor.
942*a* Eastern Archipelago (Sheet 3).
942*b*—————— (Sheet 4).
1010 Cham Collao (Cochin China, East Coast).
1023 Boddam Cove (Ladrone Islands).
1262 China from Hong Kong to Liau Tung.
2347 Japan and part of the Korea.
2376 Harbours in Formosa (China Sea).
2412 Islands between Formosa and Japan.
2575 Eastern part of the Celebes Sea.
2849 Yang-tse-Kiang. Sheet 5 (China, East Coast).

Section 14.

No. 1212 New Zealand (General Map).
1375 Torres Strait. Western Channels.
1694 Anchorages in Bass Straits.
1695 1695*a* Bass Strait (2 Sheets).
1900 Port Curtis (Australia, East Coast).
2389 St. Vincent and Spencer Gulfs (Australia).
2759*b* Australia. Southern portion.

Section 15.

No. 29 A̰hueri Bay (Island of Răp-á), South Pacific.
103 Ñgaloa Bay and Mbau Roads (Fiji Islands).
2169 Midway Island and Welles Harbour.
2906 Isle of Pines to Uen Island (New Caledonia).
2907 Uen Island to Port St. Vincent do.

Total 69 Charts.

The HYDROGRAPHIC OFFICE, ADMIRALTY,
through Capt. G. H. Richards, R.N., Hydrographer.

CH—

rench Government—

No. 2361 Côte orientale de la Chine, partie comprise entre les îles Ockseu et les îles Lamock. Îles Pescadores.

2363 Côte orientale de la Péninsule Malaise entre le Détroit de Singapoure et la Grande Redan et partie occidentale de l'Archipel des Anambas (Mer de Chine).

2370 Carte des Îles et Détroits entre Singapoure et le Détroit de Banca (Mer de Chine).

2434 Irlande, côte occidentale, de Blasket Island à Liscanor Bay.

2446 Port de Boston (Massachusetts, États-Unis).

2459 Carte de la côte de Cayenne, partie comprise entre le Grand Connétable et les îles du Salut (Guyane Française).

2472 Côtes de Pegu et d'Ava. Bouches de l'Irawady et de la rivière Bassein. Canaux de Preparis (Golfe du Bengale).

2487 Carte des Bouches du Gange. Partie occidentale comprenant les rivières Hougly, Mutlah et Houringottah (Golfe du Bengale).

2488 La Jamaïque (Mer des Antilles).

2514 Carte ouest de Sumatra, partie comprise entre le Cap Sinkel et Natal; passage Javi Javi, Îles Baniak et Île Nias.

2524*a*
2524*b* Carte des bouches de l'Ems (Mer du Nord).

2527 Carte d'atterrage de Maranhao (Brésil).

2528 Carte des Récifs et du Canal du Cap St. Roque (Brésil).

2530 Carte particulière de la côte du Brésil. Partie comprise entre l'île Santa Anna et Barra Velha d'Iguaruçu.

2531 Carte de l'Entrée Nord du Canal Sainte-Catherine, depuis Porto Bello jusqu'à Nossa Senhora do Desterro (Brésil).

2532 Plan de la baie de Bahia de Todos os Santos, 1ère Feuille (Brésil).

2533 Plan de la baie de Bahia de Todos os Santos, 2ème Feuille (Brésil).

2538 Basse Cochinchine (1ère Feuille), Province de Bien-Hoa.

2539 Basse Cochinchine (2ème Feuille), Partie Nord des Provinces de Bien-Hoa et de Gia-dinh.

2540 Basse Cochinchine (3ème Feuille), Provinces de Gia-dinh et de Dinh Tuong.

2541 Basse Cochinchine (4me Feuille), Province de Vinh-Long. Embouchure du Fleuve antérieur Tien-Giang.

2542 Basse Cochinchine (5me Feuille), Embouchures du Co-kien et du Hau-Giang.

2543 Basse Cochinchine (6me Feuille), Le Tien-Giang de la Frontière du Cambodge à Sadec. Le Hau Giang de Ca Sep au Rach Cai-Tcham.

2551 Côtes d'Ava et d'Aracan, partie compris entre Goa et la rivière Naaf (Golfe du Bengale).

2554 Plan du Port de Plymouth (Angleterre).

2562 Baie Kyau-Chau (Province de Chantung) côte orientale de la Chine.

2584 Baie de Kiel (Mer Baltique).

2585 Baie de Lubeck (Mer Baltique).

2586 Côte de Prusse, de Rostock au Phare d'Arkona (Mer Baltique).

2587 Côte de Prusse, du Phare d'Arkona à la baie de Stettin.

2589 Côte de Prusse, de la baie de Stettin au feu de Jershöft.

2590 Côte de Prusse, de Jershöft a Rixhöft (Mer Baltique).

2591 Côte de Prusse, Golfe de Dantzig (Mer Baltique).

2592 Côte de Prusse; de Brüster Orth à Memel (Mer Baltique).

2593 Côte de Russie, de Memel à Libau (Mer Baltique).

2594 Côte de Russie, de Libau à Lyserört (Mer Baltique).

2595 Entrée du Golfe de Riga (Mer Baltique).

2596 Golfe de Riga (Mer Baltique).

Charts, &c. *Donors.*

2602 Entrée de la rivière Buenaventura (Nouvelle Grenade, Amérique du Sud).

2612 Carte particulière des côtes de Brésil, partie comprise entre le Cap Sta. Martha et Itapacoroya.

2613 Kingston et Port Royal (Jamaïque).

2614 Carte particulière de la côte de Brésil. Partie comprise entre la Barra Iguaraçu et la Barra Aracati Açu.

2618 Côte occidentale de Corée. Plan de la rivière Salée ($1^{\text{ère}}$ Feuille), partie comprise entre l'île Louise et le Fort Suenson.

2619 Côte occidentale de Corée. Plan de la rivière Salée ($2^{\text{ème}}$ Feuille), partie comprise entre le Fort Suenson et l'Entrée de la rivière de Séoul.

2620 Ecosse; côte est, de Bell Rock à Kinnaird Head.

2621 Carte particulière de la côte du Brésil. Partie comprise entre Tabatinga et Agua Mare.

2625 Carte particulière de la côte de Brésil. Partie comprise entre Aracati Açu et le Cap Iguapé.

2626 Carte de la côte de Tenasserim et de l'Archipel de Mergui. Partie comprise entre l'île Sullivan et les Moscos du Nord (Golfe du Bengale).

2627 Carte particulière des côtes du Brésil. Partie comprise entre Tabatinga et Pernambuco.

2638 Carte particulière de la côte du Brésil. Partie comprise entre le cap Iguapé et Agua Mare.

2647 Côte orientale d'Arabie, partie comprise entre Maskat et Ras Merbat (Mer des Indes).

2648 Carte de l'entrée du Golfe d'Aden, comprenant la côte sud d'Arabie entre Ras Merbat et Ras al Kelb, la côte nord-est d'Abyssinie entre Ras Hadadeh et Ras Hafun, les îles de Socotra et Abd el Kuri (Mer des Indes).

2649 Angleterre, côte est d'Orfordness à Cromer.

2653 Carte particulière de la côte du Brésil, partie comprise entre le Cap Frio et Ilha Grande (Atterrage de Rio de Janeiro).

2662 Carte de l'entrée de la Mer Adriatique comprenant la côte d'Italie de Gallipoli à Brindisi, la côte d'Albanie, de Palermo à la Riv$^{\text{e}}$ Vojuza, et les ilots au N.-O. de Corfu.

2664 Baie de Panama (Amérique Centrale, côte ouest).

2665 Carte particulière des côtes du Brésil, partie comprise entre la rivière de Iguapé et la P$^{\text{te}}$ Itapacoroya.

2666 Angleterre, côte est de Cromer à la rivière Humber.

2667 Côte ouest de Palawan entre le P$^{\text{te}}$ Emergency et la baie St.-Paul, comprenant le Port Barton.

2668 Rivière Sherboro (Côte occidentale d'Afrique).

2672 Canal de Bristol (Angleterre, côte ouest).

2675 Embouchure de la Gambie (côte occidentale d'Afrique).

2677 Écosse, côte est, de Longstone à Bell Rock.

2681 Cartes des côtes méridionales de France, partie comprise entre Marseille et St. Tropez.

2682 Carte des côtes méridionales de France, partie comprise entre St. Tropez et la Frontière.

2683 Carte des embouchures de la Jahde, du Weser et de l'Elbe.

2684 Plan de la baie de Néhoué et du Port de Tanlé (Nouvelle Calédonie).

2720 Nouvelle Calédonie, partie comprise entre Toupéti et Kanala.

2721 Plan de la baie de Kanala et de la côte de Bogota (Nouvelle Calédonie).

Total 70 Charts.

DÉPÔT DES CARTES ET PLANS
DE LA MARINE, PARIS.

Charts, &c.

ADMIRAL FITZROY'S Collection of MS. Charts (40 in number), viz:—

1. Carta Esferica del Oceano Pacifico del Sur, y de una parte del Oceano Yndio. Construida para manifestar las derrotas hechas de Manila al Callao por buques de la Rl. Compañia de Filipinas en estos ultimos años. Scale 1 inch = 10½°.
2. Carta Esferica q^e comprende las derrotas de los buques de la Real Compañia hechos de Manila á Lima, y San Blas, en los años de 1799, 1800, 1801 y 1802 por el Navio Filipino al mando del teniente de Fragata de la Real Armada Don Juan de Ybargoitia, y la Fragata San Rafael, mandada por el de la misma graduacion, Don Domingo Navarro. Scale 1 inch = 5°.
2.* Chart of Tierra del Fuego, including the Straits of Magellan. Scale 1 inch = 10 miles (geo.).
3. A Plan of the Harbour of Cape Frio. Scale 2¾ inches = 1 mile (geo.).
4. Plan of Thetis Cove (Harbour of Cape Frio). Scale 1 inch = 20 fathoms.
5. Submarine Sketch of the spot in which the Remains of the Treasure lays lost in the *Thetis* (Cape Frio Harbour). Scale 1 inch = 6 feet.
6. Copy of a Chart of Bahia Blanca, taken from a Spanish Survey by E. J. P. Pearn, Master, R.N., 1830. Scale 1 inch = 4 miles (geo.).
7. Chart of the East Coast of South America from Rio San Pablo to Rio Negro.
8. Reconocimiento echo ultimamente p^r orden del Exmo. Señor D. Pedro Melo d'Portugal desde el Rio Negro al Rio Colorado en la Costa Patagonica con una chalupa. Por el 1er Piloto de la R^l Armada y Cap^n al Verg^n Carmen Don Josef de la Peña. 1795. Scale 1 inch = 3 miles (geo.).
9. A Tracing of the above.
10. Chart of the East Coast of South America, from Rio Negro to Bahia Blanca. Scale 1 inch = 9¼ miles (geo.).
11. Plan showing the Mouth and Bar of the Rio Negro on the Coast of Patagonia, 17th Oct., 1779.
12. Plano del Estero de Reloncavi en la costa occidental Patágonicao. Por el Alferez de Fragata de la Real Armada Don José de Moraleda y Montero, 1795. Scale 1⅛ inch = 1 mile (geo.).
13. Plano del Puerto de San Antonio, geometricamente levantado por Don Basilio Villarino 2° Piloto de la Real Armada, y Capitan del Bergantin Nuestra Señora del Tarmen. Scale 2⅝ inches = 1 mile (geo.).
14. Plan of the Bay of San Joseph, 1779. Scale 1 inch = 4¼ miles (geo.).
15. Plano del Estero de Comau, ô Leteu, en la costa occidental Patagonica. Levantado por el Alferez de Fragata de la Real Armada Don José de Moraleda y Montero, 1795. Scale 1 inch = 1 mile (geo.).
16. Carta de la costa septentrional del Golfo de San Jorge desde la Cala de Olmos hasta la Punta de Slaford y Cerro de Montemaior, arreglada por los reconocimientos de los pilotos de la expedicion mandada por el Superintendente interino de aquellos establecimientos, Don Antonio Reama, con el Paquebot del Rey nombrado S^n Sebastian, año de 1780. Scale 1 inch = 3½ miles (geo.).
17. Plano particular del Puerto de S^{ta} Elena y Cala de S^n Sebastian, nuevamente reconocido, demarcado y corregido por las observaciones hechas por las Pilotos de la expedicion del mando de el Superintendente interino Don Antonio de Viedma, año de 1780. Scale 1½ inch = 1 mile (geo.).
18. Plano del Puerto de S^{to} Domingo en la costa occidental Patagonica. Por Don José de Moraleda. Scale 7 inches = 1 mile (geo.).
19. Plano de la Enseñada de Tictoc en la costa occidental Patagonica. Levantado por el Alferez de Fragata, primer Piloto de la Real

Armada, Don José de Moraleda y Montero. Año de 1794. Scale $1\frac{1}{4}$ inch = 1 mile (geo.).

20. Plano del Estero de Piti Palena en la costa occiden. Patagonica. Levantado por el Alferez de Fragata, Primer Piloto de la Real Armada, Don José de Moraleda y Montero. Año de 1794. Scale 5 inches = 1 mile (geo.).

21. Carta Esferica que comprehende el Golfo de San Jorge situado en la costa Patagonica, reconocido nuevamente por el Capitan de Fragata de la Real Armada, Don Juan Gutierrez de la Concha. Año de 1795. Scale 1 inch = 5 miles (geo.).

22. Plano del Puerto de San Gregorio en la costa Patagonica, nuevamente formado por los reconocimientos y diarios de la expedicion del mando del Superintendente Interino, Don Antonio de Viedma, año de 1780. Scale 3 inches = $2\frac{1}{2}$ miles (geo.).

23. Plano de parte de la costa septemptrional del Golfo de San Jorge, Puertos é Yslas de los Patagones, desde el de Santa Elena hasta la Cala de Olmos, formado por los reconocimientos de los pilotos de la expedicion mandada por el Superintendente Interino de aquellos establecimientos, Don Antonio Viedma con el Paquebot del Rey nombrado San Sebastian. Año de 1780. Scale 1 inch = $3\frac{1}{4}$ miles (geo.).

24. Plano del Puerto Deseado, situado en la costa Patagonica, nuevamente formado por los Pilotos de la expedicion del mando del Superintendente Interino Don Antonio de Viedma. Año de 1780. Scale 1 inch = $1\frac{3}{4}$ mile (geo.).

25. Plano del Puerto de San Julian en la costa Patagonica. Nuevamente corregido y formado por los ultimos reconocimientos diarios y observaciones hechas por los Pilotos de la expedicion del mando del Superintendente Interino de aquellas colonias. Don Antonio de Viedma. Año de 1780. Scale 2 inches = 1 mile (geo.).

26. Plano del Puerto y Rios de S^{ta} Crùz situado en la costa Patagonica. Formado con arreglo á los ultimos reconocimientos que hicieron los Pilotos de la Real Armada con el Vergantin de S. M. San Francisco de Paula mandado por Don Josef de la Peña en el mes de Enero de 1782. Scale 1 inch = 1 mile (geo.).

27. Hawkins's Maiden-land, called afterwards Falkland Islands, and part of the coast of Patagonia. Scale 1 inch = 10 miles (geo.).

28. East Falkland Island, from papers communicated by Woodbine Parish, Esq. Scale 1 inch = 10 miles (geo.).

29. Part of the South-East Coast of Tierra del Fuego, with Staten Island. Scale 1 inch = $9\frac{1}{4}$ miles (geo.).

30. Survey of Staten Island, by Lieut. E. N. Kendall, R.N., 1828, made in one of the boats of H.M.S. Sloop *Chanticleer*, by order of Commander H. Foster. Scale 1 inch = 70 miles (geo.).

31. Chart of Cape Horn and part of the Coast of Tierra del Fuego, by J. Weddell, R.N., in 1823 and 1824. Scale 1 inch = 11 miles (geo.).

32. West Coast of Patagonia, from Cape Victory to Cape Providence, with part of Desolation Island. Scale 1 inch = $1\frac{3}{4}$ mile (geo.).

33. Harbour of Mercy (West Coast of Patagonia), 1828. Scale $6\frac{1}{2}$ inches = 1 mile (geo.).

34. Chart of the West Coast of South America, from 49° to 52° latitude. Surveyed by P. Stokes, Esq., Commander, and W. G. Skyring, Lieutenant, H.M.S.V. *Beagle*. Under the orders of P. P. King, Esq., Senior Officer of the Expedition, and Commander H.M.S.V. *Adventure*, 1828. Scale 1 inch = $7\frac{1}{2}$ miles (geo.).

35. Island of Chiloe, by Francisco Hurrado. Scale 1 inch = $5\frac{1}{4}$ miles (geo.).

Maps, Charts, &c. *Donors.*

36. Plano Topografico del Terreno que média entre Lima y el Callao. Joseph Vazquez. Lima, 1794. Scale 1 inch = $1\frac{1}{8}$ mile (geo.).
37. Plan showing the position of the Bajo de las Hormigas, Callao. Claudio Vila. Lima, 1802. Scale 1 inch = 4 miles (geo.).
38.
39. Three Plans .. .. ALL PURCHASED.
40.

MISCELLANEOUS.

Two Diagrams illustrating the Transit of Venus over the Sun's Disc for the Year 1882 .. .. .. Staff Commander J. E. DAVIS, R.N.

Five Outline Maps, showing the Engraving and Shading of Hills by the Tritinto and Medallion Process.

Squares showing the relative Size of the Scales of various Government Surveys. (*MS.*) .. .. Sir R. I. MURCHISON.

Nine Photographs of Mount Sinai and the vicinity, viz. :—
1. Jebel Musa and Wadys on the West from Wady er Râhah.
2. View of Wady er Râhah and Jebel Sena from the summit of Jebel ed Deir.
3. View from Summit of Jebel Musa, looking North.
4. Plain of Senned, 8 miles N.E. of Jebel Musa.
5. Defile in Wady es Sheikh (probably the site of Rephidim), looking Northward.
6. Wady es Sheikh, with Jebel Serbal in the distance.
7. View from Summit of Jebel Mûsa, looking South.
8. View from Summit of Jebel Mûsa, looking North.
9. Defile in W. es Sheikh (probably the site of Rephidim), looking South .. .. Rev. F. W. HOLLAND.

Twelve Photographs in Abyssinia, viz. :—
1. Annesley Bay.
2. Camp at Zoola.
3. Camp at Senafe.
4. Addigraht Church.
5. Addigraht Tower.
6. The Devil's Staircase.
7. Abyssinian Group.
8. Adam and Eve. The Crucifixion.
9. St. George. St. Theodore.
10. Abyssinian Cross on the end of a crozier.
11. Portion of the Gospel of St. Mark.
12. Do. do. do.

View of the Action of Arogee under the Heights of Fahla and Selassie. Fought 10th April, 1868. From a sketch by Lieut.-Colonel R. Baigrie, A.Q.M.G. Lithographed at the Topographical Depôt, War Office. London, 1868. WAR OFFICE, PALL MALL, through Sir E. Lugard.

View of Magdala, taken from the East by Th. von Heuglin, 20th March, 1862. Lithographed at the Topographical Depôt, War Office. London, 1868.

View of the Capture of Magdala, 13th April, 1868. From a sketch by Lieut.-Colonel R. Baigrie, A.Q.M.G. Topographical Depôt, War Office. London, 1868. WAR OFFICE, PALL MALL, through Sir E. Lugard.

Vista de la Ciudad de Mendoza. Tomado desde el cabildo en 1860.
El Serro de Montevideo. Por D. Dulin. Paris.
Montevideo. Visto del Serro. Por D. Dulin. Paris.
Bombardeio ao Forte Itapiru pela Esquadera Brasileira em operacoens contra o governo do Paraguay, 16 de April, 1866.

Maps, Charts, &c. *Donors.*

Tomada das trincheiras de Curusu no Paraguay, pelo segundo Corpo de exercito ao mando do Exm^{o} barão de Porto Alegre, 4 de $7^{\text{bre.}}$ 1866.

A cononheira encorassada Tamandaré despois del combate com as baterias das barrancas de Curupaity no Paraguay no dia 22 de Setembro de 1866.

A corveta encourassada Brasil. Despois do combate com as baterias das barrancas do Curupaity no Paraguay no dia 22 Septembro de 1866.
T. J. Hutchinson, Esq., H.M.S. Consul, Rosario.

A Pictorial Diagram of Cockburn Island, in the Antarctic Regions.
Staff Commander J. E. Davis, R.N.

A Bust of Richard Lander, Esq., the First Gold Medallist and Discoverer of the Course of the Niger River .. .. .. Mrs. Elson.

Mahogany Case to enclose a piece of Bullock's Hide, with Inscription, sent from Somali Country .. .. Miss L. Jones.

INSTRUMENTS LENT TO TRAVELLERS.

To the late Mr. I. Duncan, Vice-Consul at Whydah, in 1849—

Telescope.
Two Compasses.
Aneroid Barometer.

Dr. P. C. Sutherland, M.D., F.R.G.S., at Natal—

Brass Sextant (7½-inch), with Silver Arc, by Troughton and Simms.
Strong-framed Artificial Horizon, by Troughton and Simms.
Two Barometers (Mountain), with Improved Iron Cistern, by Newman.

The late Dr. E. I. Irving, M.D., F.R.G.S., at Abeokuta—

Pocket Chronometer, by Barraud and Lund.
Barometer (Mountain), by Troughton and Simms.

Dr. D. Livingstone, M.D., F.R.G.S., Zambesi, Eastern Africa—

Sykes's Hypsometrical Apparatus, No. 1, with Sling Case, by Casella.
Standard Thermometers, 0 to 212, in Brass Cases, ,,
,, ,, in Maroon Cases, ,,
Artificial Horizon, with Sling Case, ,,
Prismatic Azimuth Compass, silver ring, with leather Sling Case, ,,
Rain Gauge.

Dr. D. Walker, M.D., F.R.G.S., Russian America, Dec. 8, 1862—

Sextant, 4 in. radius, by Cary.
Artificial Horizon, Circular, by Cary.
Azimuth Compass, by Elliot.

The late Mons. Jules Gerard, Upper Guinea, towards Timbuktu, Feb. 4, 1863—

Sextant, 3-inch radius, by T. Jones.
Aneroid, white metal, by Spencer, Browning, and Co.
Artificial Horizon, spirit-level, by Elliot.
Boiling-water Apparatus, and three Thermometers in brass tubes.
Azimuth Compass, by Burnier.
Two small Pocket Compasses.
Protractor, brass, 2-in. radius.
(The above in Leather Case.)
Measuring Tape, 50 feet.
Thermometer, on metal, in Morocco Case.
Protractor, horn, circular.

H. Whitely, Esq., in South Peru, March 28, 1867—

Pocket Aneroid, No. 89, graduated to 15 inches, by Cary.
Hypsometrical Apparatus, and 3 Boiling-point Thermometers, by Casella.

Rev. F. W. Holland, Sinai, June 25, 1867—

Prismatic Compass and Stand, by Cary.
Pocket Aneroid, graduated to 15 inches, ,,
Hypsometrical Apparatus, and 3 Thermometers, B.P.
Two Thermometers, divided to 230° for hot springs.
Three Alpine minimum Thermometers.

PRESENTATION

OF THE

ROYAL AWARDS.

(*At the Anniversary Meeting, May 24th,* 1869.)

ROYAL MEDALS.

THE PRESIDENT addressed the Meeting as follows:—

The Founder's Medal has this year been awarded to Professor Nordenskiöld, of Stockholm, for having performed a leading part in designing and carrying out the late Swedish expeditions to Spitsbergen, by which not only has our knowledge of the geography of that part of the world been much improved and illustrated by a excellent new map of those islands, but whereby great additio have been made to our acquaintance with the zoology, botany, geology, and meteorology of the Arctic Regions.

Anxious as the Royal Geographical Society has ever been and sti is to promote Arctic researches, we naturally entertain the high respect for the noble efforts which the Swedes have made of lat to open out one of the main lines through the frozen seas, by whic the North Pole may, it is hoped, be approached if not reache Seeing that our Northern friends are still persevering in the sa cause, from the carrying out of which richer and more powerf maritime nations have, alas! shrunk, our Council has decreed th the person who headed the men of science in this Swedish expedition, and obtained such important results, should be rewarded wi our Founder's Medal, and thus, by our marked approbation, b cheered on to further successes.

As an honorary Member of the Royal Academy of Sciences Stockholm, and with a vivid recollection of the eminent men, fro the days of Berzelius downwards, with whom I have been as ciated, I have peculiar gratification in handing this Medal to Bar Hochschild, the Swedish Minister, and in requesting his Exce lency, the worthy representative of a Sovereign who is a distinguished geographer and one of our Royal Associates, to convey th Medal to his eminent countryman, Professor Nordenskiöld.

ıen turning to Baron Hochschild, he continued :—

beg your Excellency to understand that, whilst we have l upon Professor Nordenskiöld as the recipient of our highest ›ur, we fully recognise the great merits of the other Swedish of science who were associated with him, and whose names recorded in our volumes. From among those I may par- larly mention M. Otto Torrell, who in 1858, at his own expense, the way in organising and directing the first of these expe- ›ns, which have shed so much lustre on his country, whilst also my pleasing duty to acknowledge how much the success ıe last expedition was due to the skill of the Naval Commander, ıtenant Fr. W. von Otter.

aron de Hochschild thus replied :—

r. President, I regret exceedingly that circumstances should prevented Professor Nordenskiöld from attending here to-day self. Being a man of science, he is more worthy than I am to k in this room; and he would most probably have given you interesting details of his last important discoveries. However, nodesty, perhaps, would have proved an obstacle to expressing gratitude, and would have prevented him telling you how very d he is of the great honour you do him to-day. I am sure that vill consider it not only as a reward for his past labours, but as ncouragement to future deeds. You have, Mr. President, alluded y Sovereign as a geographer. I am sure his Majesty will have h pleasure in hearing that his name was received with so much pathy here. There were two words I noticed in what you said, President: you said, "our Northern friends." I hope they will ys retain that name.

he President then spoke of the recipient of the Patron's or oria Medal:—

he Victoria Medal has been adjudicated to Mrs. Mary Somerville, throughout a very long life, has been eminently distinguished er proficiency in those branches of science which form the basis hysical Geography, and who having published a most able work ıat science, was recently occupied, even in her 89th or 90th year, lving abstruse mathematical problems. This gifted woman, in addition to her researches into the phenomena of the ens and the earth, has also excelled in the arts of painting, c, and all feminine accomplishments, has, like the Crichton of earlier days, truly earned the title of "the admirable Mrs. Somerville."

On one former occasion only has the Council devoted our Patron's Medal to a lady, namely, Lady Franklin; and as in that case the Queen was pleased to approve of our having honoured that lady for her services in ascertaining the fate and establishing the glory of her husband, so in the present instance I feel convinced that our gracious Sovereign will rejoice that her effigy should be borne by one of her own sex, who has attained such a high position amongst those who have largely advanced human knowledge.

On my own part, as your President, I can truly say that no act of my life could be more grateful to my feelings than to be the medium of conveying this Victoria Medal to the eminent authoress, who, throughout a period approaching to half a century, has honoured me with her friendship.

ADDRESS

TO

THE ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 24th May, 1869.

BY SIR RODERICK IMPEY MURCHISON, BART., K.C.B.,
PRESIDENT.

GENTLEMEN,

The Council having again kindly invited me to preside over you, I commence this Address with the expression of my hope that, if you should elect me, you will be pleased to make due allowance for the inevitable shortcomings of your old leader. Looking back to my Address of 1844, when I first occupied this chair, I know too well that I no longer possess that fund of knowledge which I had then recently acquired, by long journeys in Russia and the Ural Mountains and in many parts of Europe, and which imparted a freshness to my words that I cannot now command. But though my present energies of mind and body may be ill contrasted with those of the days when I could climb high mountains, and rouse you by a recital of the personal adventures of others as well as my own, I still maintain the same heartfelt devotion to your cause, whilst I am more grateful to you than ever for the kind indulgence with which you continue to receive my endeavours to serve you.

In that Address of a quarter of a century back, I already dwelt with pride on the high position which, after thirteen years of existence, this Society had taken up. It was then that I commenced that appeal to the public which induced the House of Commons, on the motion of Mr. Joseph Hume, to grant us the annual sum of five hundred pounds to keep up a National Map Office. This grant, which has ever since been continued, has enabled us to prosper, free of charge for house-rent. Our numbers, however, having augmented from 670 to 2300, our apartments, which we had taken on lease, though adequate to contain our books and maps, have ceased long ago to be capable of holding one-third of the Members who attend our Evening Meetings. Hence we have been indebted for some years to the liberality of the Royal Society and the University of London for permission to assemble in their Great Hall, now, alas! demolished; and now, through the kind consideration of the Managers of the Royal Institution, we congregate in their excellent theatre.

When I consider the highly useful and popular character of our Body, and its intimate connection with the Foreign and Colonial Offices, and the Admiralty, I still entertain the hope that her Majesty's Government will, ere long, provide us with a mansion sufficient for our wants, the more so as six other scientific Societies are at this moment about to be provided, at the public expense, with Meeting Rooms and Apartments at Burlington House. But if this consummation should not be attained, we shall have time sufficient, before the lease of our premises in Whitehall Place expires in September, 1871, to provide ourselves with a Meeting Hall and Offices of our own. Meantime I may express my regret that, in the new scientific buildings now in the course of construction at Burlington House, no arrangements have been made for a large common Hall, containing accommodation for five hundred persons. It is only in the large building of the adjacent University of London, now rising to completion, that such a capacious Hall is in preparation; and, reverting to the former kind consideration of the Senate of that Body, I trust that we shall be permitted to hold our Evening Meetings in it whilst a large Hall of our own is being prepared.

In the mean time, adverting to our present state, I have to congratulate you on the further augmentation of our numbers, as well as upon the punctual issue of the last important and unusually large volume of the 'Journal.' When I look to the various duties, besides the editing of these volumes and the 'Proceedings,' which are performed by our indefatigable Assistant-Secretary, including the recent addition of much correspondence incident to our engagement to distribute Medals to the best geographical proficients of the Public Schools, you will all unite with me in offering our heartiest thanks and acknowledgements to Mr. H. W. Bates.

OBITUARY.

I naturally commence the record of our losses by a brief sketch of the truly eminent geographer and scholar, the late Lord STRANGFORD.

Percy Sydney-Smythe, the third son of the sixth Viscount Strangford, was born on the 26th November, 1825, at St. Petersburg, during his father's embassy in Russia; and, although after a few months he was sent over to England, the first language he spoke was Russian. He did not retain it after six or seven years old; but this early change of mother tongue, if it may be so termed, may have been some help to the extraordinary facility he displayed throughout his life in acquiring languages colloquially as well as by book.

His passion for languages developed itself at a very early age. Unable from partial blindness to join in playground sports, he occupied his out-of-school hours (at Harrow) in learning Persian from a grammar and dictionary of his own purchase, while his examiners will well remember what he achieved in Latin and Greek at the same time. During the one year he remained at Oxford, he taught himself Arabic, and was naturally chosen as one of the two "Student Attachés" nominated from Oxford and Cambridge, in 1845, for Constantinople—an idea having been formed of attaching young men to embassies in the East, for the study of Oriental languages. He became paid Attaché in 1849, and was afterwards made Oriental Secretary, an office he held till he retired from the service in the middle of 1858, having in the previous year succeeded his brother in the title. How he worked at Constantinople his companions there could tell best; but it was in these years that, while labouring assiduously in his official work which he never shirked, he acquired all the immense knowledge that astonished those who knew him well, but of which, alas! so little fruit has been left to the world. From the very first he made a thorough study of Sanskrit, and mastered all and every branch of the languages of the East, carrying them on to their more modern results in the West. He never studied and never took much interest in Chinese or in the Polynesian group of languages; but the study of all the rest became his chief employment. Profiting by the acquaintances he made in the un-Europeanized quarters of Stamboul, he soon spoke Persian and Greek with the facility of a native of the respective countries; could detect the differences of every dialect in pronunciation and idiom of the latter language; whilst the former became so completely his own, that to the very last, if he was suddenly startled, or when talking aloud to himself—a very constant habit of his—nine times out of ten he spoke in Persian.

But mere language was by no means the ultimate aim of his labours; on the contrary, he made it his study both on account of its connection with the history of man, and because he believed it to be the one only absolutely trustworthy key to this history from the beginning: it was with this larger, wider, higher view, that it interested and absorbed him; and it is for this that his early death is to be deplored as an irreparable loss; for where numbers have studied and will study the details of each phase of these subjects, there are but few who, with the talent of amassing so much detail, have the power of grasping the wider and larger features into one great whole.

The great histories, now shrouded in the mists and veils of antiquity, of the pushing on of one horde after another from the centres of Asia over the plains of Eastern Europe, and the formation of nation after nation in the West, demanded another branch of knowledge,—namely, that of physical geography; and if Language was Lord Strangford's passion, Geography was his delight. In this study he stood pre-eminent. He knew nothing beyond the faintest outline of geology, but he comprehended in his geographical knowledge the understanding of all the features and *contours* of every country, besides the details of each. He never rested till he knew the height and direction of all the mountain-ranges, the extent and boundaries of the river-basins, with their valleys and plains; necessarily assisting this study by that of meteorology and climate. Thus his knowledge of geography became profound and full, while his curiously accurate memory enabled him to remember the names of towns and villages, which united them in his mind with the languages and manners of the inhabitants of each nation—the names confirming the geography, and the geography confirming the language.

Lord Strangford's health, naturally extremely delicate, was destroyed by overwork during the Crimean war; and he was disappointed at finding himself unequal to the fatigues of rough travelling, when, on succeeding to the title, he had leisure and means for so doing. For a few years he tried it, and made plans for far-away journeys; but it became too soon apparent that home was the best place for him, and he reluctantly gave up all hopes of leaving England, even for the commonplace travelling in Switzerland, which had been an immense pleasure to him. The meteorological changes in that country were a constant source of interest to him when there; and he had an intense enjoyment of scenery, although able only to see it with the aid of powerful opera-glasses. His aneroid was at all times his inseparable companion; indeed he was rarely to be seen anywhere a couple of miles from home, even in London, without the aneroid in his pocket.

She who knew him best can truly speak of his fine temper—of his passionate love of truth and justice—of his indignation against all shams and false pretences—of his goodness and gentleness in private life—of his perfect and remarkable freedom from all malevolence and jealousy—or of his freehanded generosity in giving every man his due, and more than his due, for honest conscientious work—of his keen appreciation of humour and the fund of quiet goodnatured irony in himself, and of his warm and hearty fidelity as a friend. And this was combined with singular humility and modesty. No one ever heard Lord Strangford say one word which could be construed into a boast of himself, or a claim for his own acquirements; on the contrary, he was always ready and anxious to learn from others, with a frank avowal of his own ignorance. When in company with those who felt themselves his inferiors in knowledge, he hung back, rather than led; while to those who sought for information from him, he poured out all from his own stores with lavish kindness.

But this excessive mental activity was too much for Lord Strangford's feeble body. He was attacked at the end of July with a slight and partial paralysis, the effect of over-fatigue, but from this he appeared to have completely recovered, when, on the morning of the 9th of January, an effusion of blood took place on the brain, and he breathed his last in a few hours at the early age of 43 years.

What our Society has lost by this sad and unexpected event is deeply felt by us all; but I must add that my grief on the occasion has been greatly augmented by the deep sympathy I feel for his widow, the daughter of that beloved and sound geographer, the late Admiral Sir Francis Beaufort. The suffering of this most accomplished lady has been intense; but in her sorrow she has, at my urgent request, furnished me with many of the preceding lines; and our Fellows will greet them as the warm and truthful effusions of a deeply attached wife, who has given us those just and delicate delineations of the character of our lamented associate, which no other pen could have so truly indited.

VON MARTIUS.—Germany has lost a truly great man in Charles Frederick P. VON MARTIUS, whom we were proud to claim as one of our Honorary Members. This renowned naturalist and traveller, who died in December, 1868, had so high a repute that many of his countrymen placed him on a level even with Humboldt. He was born at

Erlangen, in Bavaria, in 1794, and his father, the Court Apothecary of that place, having given him an excellent education, he soon took high academical honours, and in 1817 was sent to investigate the natural history of Brazil, by the Austrian and Bavarian Governments, in company with M. Spix. In carrying out their mission, the then almost unknown territory of Brazil was traversed in its entire length through the interior from south to north, and along the River Amazons from the Atlantic to the Peruvian frontier. Returning to Europe in 1820, the remainder of his long and laborious life was occupied in elaborating the results of this great journey, the narrative of which, chiefly written by himself after the death of his colleague, has become a classical book of travel, under the title of 'Spix und Martius' Reise nach Brasilien.' The third volume of this great work, which relates to the Amazons portion of the journey, and is little known in this country, contains, besides the personal narrative of the voyage up the river, a *résumé*, it may be said, of all that was previously known of the Amazons region, showing the amount of conscientious labour, in the closet as well as in the field, employed by von Martius in all he produced. It is additional testimony of no small value to the value of this work that Mr. Bates, now our Assistant-Secretary, who explored the Amazons for 1400 miles in the track of the great traveller, and has carefully studied the narrative of von Martius, was astonished, as he has informed me, at the extent and accuracy of the information acquired by him during so rapid a journey. The numerous publications on botany which followed so raised the estimate of his character that he was advanced to posts of high consideration in his own country. Of the botanical works he composed, the greatest, doubtless, was that on Palms ('Genera et Species Palmarum,' 1823). by which he raised the number of species from 15 as reckoned by Linnæus, and 99 by Humboldt, to the vast number of 582.

I should, however, entirely fail to do justice to von Martius if I spoke of him as a botanist only; for, in addition to much knowledge of other branches of science, he was truly eminent in our closely allied sister science, Ethnology, of which, in the last years of his life, he gave a memorable proof in his sketch of the South American Indians, especially those of Brazil, accompanied by a collection of the vocabularies of these autochthones. In this work the author collected with great ability all those facts which enabled him to give a clear and, in some respects, quite a new idea of the origin and relations of these South American nations, tribes, and families which have been for countless ages in a state of change. Of this work, Professor Huxley assures me that it contains by far the best and most exhaustive account of the physical character, the geographical distribution, and the social organization of the primitive inhabitants of the Brazils extant.

In a letter I received from this eminent man in October, 1866, when he sent me a copy of his well-composed and apposite *éloges*, which, as Perpetual Secretary of the Academy of Munich, he pronounced on the deceased members, he thus alluded to his ethnological volumes on South America:—"When these shall be printed, all the time and power remaining to an old man shall be applied to the completion of my 'Flora Brasiliensis,' in which labour I am proud to boast of the active co-operation of your eminent countrymen Bentham and Hooker."

Another of our countrymen, the late Robert Brown, justly renowned as the "Princeps Botanicorum," was one of the ardent admirers of von Martius; and, in truth, he was a man of so thoroughly genial a disposition that all our leading botanists, including Sir W. Hooker, loved him as a man and revered him as a great authority.

M. DE LA ROQUETTE.—I will next say a few words in honour of an eminent French writer, the late M. de la Roquette, who was elected Honorary Corresponding Member of our Society in 1857. This excellent man was most distinguished by his devotion to the memory of distinguished geographers and travellers, which led him to compile their biographies with much research, accuracy, and warmth of appreciation. Thus we read in the *Bulletin* of the French Geographical Society, of which body he was one of the founders, the Lives of Hommaire de Hell, Dubois de Montperreux, Lieutenant Bellot, Sir John Franklin, Constant Prevost, Alexander von Humboldt, Daussy, and Jomard. When he was engaged in writing the Biographies of our famous countryman Sir John Franklin and of the illustrious Alexander von Humboldt, M. de la Roquette procured from me many letters of these great men which I possessed, and which threw fresh light on their characters. He was the author also of numerous articles in the *Biographie Universelle*, and of many papers on geographical subjects, published in the *Bulletin* of the Geographical Society of France, and in the *Annales des Voyages*, to which he was a contributor so long ago as 1824, in the time of the elder Malte-Brun, the editor of that important serial publication devoted to our Science. A member of the French Geographical

Society since its commencement, he was for several years the General Secretary of that Body, in which office his great activity and love of geographical pursuits enabled him to render great service. So much were his labours appreciated that he was elected Vice-President of that Society in 1847, and again in 1857 and 1858, and a few years before his death he received the title of Honorary President.

M. de la Roquette died in the eighty-fourth year of his age, and was buried in the presence of many distinguished men of science on the 12th of last August; the funeral oration being pronounced by that eminent leader of the French geographers, M. d'Avezac, of whom we are justly proud as one of our Foreign Associates, and who, I am happy to say, is still enjoying good health. In that graphic sketch M. d'Avezac indicates the various phases of the career of M. de la Roquette before the year 1821, when he seriously attached himself to geography. In it we are also reminded of the various translations of foreign works which he carried out and annotated, such as those of the English Expedition up the Orinoco and Apuré rivers by Hippisley, Wilkinson's Description of Moldavia and Wallachia, and the Voyages of Columbus, which he translated from the Spanish in conjunction with our Foreign Associate, my old companion, Édouard de Verneuil. His last work was the publication of many of the most remarkable letters of Alexander von Humboldt, which he collected with great assiduity. Of these, one volume only has appeared, but the other is far advanced. Activity and conscientious accuracy, as M. d'Avezac has well said, were the dominant features of the character of de la Roquette, and these, combined with the kindliest manners, rendered him a great favourite among numerous friends and acquaintances.

Sir **James Brooke**, Bart., K.C.B.—No one of our deceased Fellows deserves a more lasting place in our annals than the late Sir James Brooke, so widely known as the Rajah of Sarawak, who died at his seat in the south of Devonshire, on the 11th June, 1868. The son of a civil servant of the East India Company, he was born at Bandel, in Bengal, in 1803. Shortly after, entering military service, he was severely wounded in the Burmese war, at Ringpoor, and returned to England. Subsequently he visited China, and it was on his return from that country that he undertook, at his own cost, in 1838, that expedition to Borneo, which by the energy and devotion with which he carried it out, and from the important results with which it terminated, has justly won for him a foremost place among the most enterprising of British explorers who have followed in the track of Raleigh.

The fitting out of his own yacht, the *Royalist*, with the bold and avowed object of suppressing piracy in the Eastern Archipelago, and the progress he made in visiting different places in these seas, is graphically given in his own Diaries, most fortunately preserved for the public through the friendship of that gallant and accomplished officer, Captain, now Admiral, Sir Rodney Mundy. In them we learn what great difficulties he had to overcome in extirpating piracy among the Dyaks* of Borneo, and the feats which were accomplished by the crews and boats of the *Iris* and *Phlegethon*, in all of which adventures Brooke took a leading part with his friend, Captain Mundy, as depicted in this work with illustrations. Afterwards, in the Expedition to Borneo of H.M.S. *Dido*, under Captain, now Admiral, Sir H. Keppel, which took place in 1846, we further learn with what eagerness he strove to suppress piracy, and to bring the native Dyaks to a sense of order, and how he established his own Government of Sarawak, of which he had been declared the Rajah in 1841, at the desire of Muda Hassim, his predecessor in that dignity. His official proclamation as Governor of Sarawak dates from the 21st of September, 1841, on which day the British flag was there hoisted. Men of his generation can remember with what delight the Rajah was received in England in 1847, when he returned after all these exploits. Even the Queen congratulated him, conferring on him the knighthood of the Bath, and the Lord Mayor and Common Council voted him the freedom of the City of London; he received the diploma of D.C.L. from the University of Oxford, amid many plaudits, and, not least, we honoured him with one of our Gold Medals. He was created also, by the Queen, Commissioner and Consul to the Native States of Borneo, and Governor of Labuan, which latter island, valuable as promising coal, was purchased from the Sultan of Borneo by the British Government.

But, alas! this noble example of a chivalrous English gentleman was destined to undergo much severe criticism, and to brave and to have to stand against charges publicly brought against him (as I think, in a mistaken view of the subject) by that honest and straightforward, but occasionally uncompromising economist, Joseph Hume; whose endeavours, however, to procure from the House of

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* 'Journal of James Brooke,' by Captain Rodney Mundy, R.N., p. 183.

Commons what would have been equivalent to a censure on his conduct were more than once defeated.

On the other hand, our deceased Fellow had numerous warm supporters, including the naval officers Admirals Sir Thomas Cochrane, Sir James Gordon, Sir H. Keppel, and Sir Rodney Mundy, with whom he had been associated; and one of his most zealous defenders was our former President, that enlightened nobleman, Francis Egerton, the first Earl of Ellesmere.

This period of trouble being passed, not, however, without great mental suffering and injury to his bodily health, Sir James Brooke was taken out in 1853 to his Government of Sarawak by his distinguished friend Admiral Hall. He and Keppel had the gratification of seeing order thoroughly established, a good Christian Mission organized which ended in the establishment of a bishopric, the duties of which were zealously performed by the Right Rev. F. M. MacDougall, Bishop of Labuan. During the last years of his residence in Sarawak (1857) Sir J. Brooke very narrowly escaped being killed, through a sudden attack of an infuriated body of Chinese, who had been irritated to madness by the suppression of the trade in opium; and on this occasion, as in every event of his life, he showed the most perfect coolness and resolution.

Viewing the career of Sir James Brooke as Rajah of Sarawak, we have a right to be proud of him, as a singularly gallant and successful explorer and an enlightened administrator; whilst every one who knew the man became attached to him, from those manly and open manners by which, doubtless, he exercised a great influence over the uncivilised people among whom he had cast his lot. Among his numerous warm friends no one had a sincerer regard for him than that patroness of all good works, Miss Burdett Coutts.

The late lamented Rajah Brooke was buried in the secluded village of Shapstor, Devonshire, near his residence of Bunator, at which he died. He bequeathed his property and rights to two nephews successively, and, failing any children of the present Rajah and his brother, he willed the reversion of them to the Queen. By this document he authorized his kind and attached friend, Miss Burdett Coutts, to carry out his wishes in a joint-trust with Mr. J. A. Smith and Mr. Thomas Fairbairn. By this act he also gave a clear proof of his loyal feeling towards the poor people whom he had raised from an abased condition to a state of comfort; by it he further evinced his resolution to prevent future misgovernment, and thus to entail, as it were, the official register that Sarawak must, from its important maritime position and useful productions, be ever held as a British dependency.

Sir C. WENTWORTH DILKE.—The sudden death of Sir C. Wentworth Dilke, Bart., at St. Petersburg, on the 10th May, has deprived the public at large of a very useful and respected member, and our Society of one of its old associates. Sir Charles Wentworth Dilke, Bart., had repaired to St. Petersburg, with his younger son, Mr. Ashton W. Dilke, to act as the representative of British Horticulture at the Congress of Botanists and Florists, now assembled at the Imperial city, and I had myself given him letters of introduction to my friends within it.

Educated at Westminster School and Trinity College, Cambridge, he soon left the bar, for which he was designed, and entered with vivacity into literary work, chiefly as connected with the 'Athenæum' weekly journal, of which his father was long the proprietor and editor. He took a very active part in establishing the Royal Horticultural Society, and thereby attracted the marked notice of his Royal Highness the Prince Consort. He was also one of those who resuscitated and imparted fresh energy to the Society of Arts, which has since risen so highly in public estimation. The success of the Great International Exhibition was in a considerable degree indebted to him, as will be acknowledged by Mr. Henry Cole, C.B., who then commenced that series of efforts to encourage the Establishments at South Kensington for the promotion of Science and Arts, which prospered so strikingly under the ægis of the late lamented Prince Consort.

The brilliant success of the Exhibition of 1851, in which Wentworth Dilke acted as one of the most energetic of the Executive Committee, led her Majesty's Government to name him one of the five Royal Commissioners for conducting the second Great Exhibition of 1862; and it was after the demise of the Prince Consort, whose views he so effectively supported, that the Queen conferred the title of Baronet upon him.

Sir Charles Wentworth Dilke entered the House of Commons as Member for Wallingford, which he represented until the last dissolution. He is succeeded in the title by his eldest son, one of the new members for Chelsea; who has already, at his early age, attained well-merited distinction by his remarkable work entitled 'Greater Britain,' in which he has not only much excited the reading public, but has shown that he possesses the true spirit of a British explorer, the capacity of an able statist, and the felicity of a ready writer.

In reference to our deceased member, Sir C. Wentworth Dilke, I ought further to state that he served gratuitously as the English Commissioner at the Great American National Exhibition at New York in 1853.

Mr. J. H. BROOKING, who died on the 13th January, 1869, a highly respected merchant in the city of London, was one of the best supporters of our Society, to which he attracted many influential mercantile gentlemen, who, like himself, felt that geographical explorations in distant lands frequently lead to most important commercial results. By his death we have lost a very effective member of our Council, and a clear-headed man of business, who watched zealously over our finances, and who had most certainly at heart the permanent interests of our Body.

Sir JOHN P. BOILEAU, Bart., who died on the 9th of last March, was much esteemed by a large circle of friends for his engaging social qualities, and his extensive accomplishments. He was a Vice-President of the Society of Antiquaries.

Mr. JOHN DICKINSON, F.R.S., for many years a Fellow of this Society, had at the time of his decease, on the 11th of January last, nearly attained the advanced age of 87. Actively engaged in business pursuits during by far the greater part of his long life, he still took a keen interest in various branches of science, and more especially those of astronomy and geography, having constructed an observatory at his country house of Abbots Hill, in Hertfordshire, and having in his later years devoted the greater part of his leisure hours to the study of narratives of recent geographical discoveries. As a mechanical inventor he was well known, particularly in connection with the manufacture of paper, which he materially assisted in bringing to its present state of perfection. Besides various pamphlets connected with the water supply of London, and other questions of the day, he communicated to the Royal Society some observations on the supply of water from the chalk stratum in the neighbourhood of London, containing much valuable information, and including records, extending over many years, of the amount of percolation through a Dalton gauge, which have since been frequently quoted.

I have only to add that Mr. John Dickinson was very highly respected by numerous cultivators of science, letters, and the fine arts, and that in common with many of my friends I fully appreciated his fine social qualities.

Sir Edward Cunard, Bart., was distinguished by the talent and activity he displayed in keeping up in perfect efficiency the famous line of rapid packets between America and England established by his father, the first Baronet, and has left behind him a really good and respected name.

Rev. S. W. King, Rector of Saxlingham, Norfolk, was a man of high scientific attainments, known to the general public as the author of the 'Italian Valleys of the Alps.' He was not only a geographer, taking a lively interest in the operations of our Society, but a cultivator of various other allied branches of science, including geology, entomology, and archæology, having imbibed these tastes from his father the Rev. W. H. King, an accomplished scholar, who resided at the vicarage of Nuneaton, Warwickshire, where our late associate received the rudiments of that solid education which rendered his later life so distinguished. As an antiquary he published several interesting papers, and his geological researches in Norfolk are well known to the cultivators of that noble science, some of his discoveries having been made public in Sir Charles Lyell's 'Antiquity of Man.'

Mr. King has been called away in the prime of life; had he been spared, there is no doubt he would have made for himself a name and a place in the highest ranks of science. He died on the 8th of July, 1868.

Dr. H. Norton Shaw.—Although never enrolled on our lists as a Fellow of the Society, and therefore not strictly coming within the scope of the Obituary, to which the occupiers of this Chair are confined, I feel it to be my duty to say a few words respecting one who was for fourteen years the active Assistant-Secretary of our Body, and whose zeal and ability were exerted in promoting the welfare of the Society by procuring numerous additions to its members.

Born in one of the Danish West India Islands, the son of a General in the Danish service, young Norton Shaw received part of his education in New York. He afterwards became an Assistant-Surgeon in the Navy, and, having retired from that vocation, he was chosen in 1848 our Assistant-Secretary. At that time, the number of our Fellows was not more than a third of what it subsequently became, and Dr. Shaw had the merit of supporting the then President, Captain (afterwards Admiral) Smyth, with so much vigour that new life was infused into our proceedings; and the Roll of our Fellows first assumed that progressive enlargement which has not abated down to the present time.

Among the many cases in which he personally exerted himself to promote the interests of the Society and the cause of Geography, I shall ever remember the zeal with which he successfully advocated the appeal that I made to erect a Memorial to the brave young French officer Bellot, who lost his life in the search after Franklin, and which monument stands on the Quay near Greenwich Hospital. Let me also place it on record that it was Dr. Norton Shaw who took the most active part in the organisation of that great festival which was offered to Livingstone after his first great exploration in Southern Africa, and at which I presided to do honour to the illustrious traveller. In short, it was on occasions when honour had to be shown to the good deeds of geographical explorers that the services of our late energetic officer were most conspicuous.

Though he never published original works, his name is connected as editor with various good and useful publications, and the 'Royal Illustrated Atlas,' which he conducted, was very creditable to him; whilst his services as Editor of the annual volumes of our Journal, during so many years, give him a just claim on our gratitude.

Some time after leaving our service, at the end of the Session of 1863, he was appointed by Lord Stanley, then Secretary for Foreign Affairs, British Consul at the island of Ste. Croix, at which place, being a Danish possession, he was well qualified to act, from his knowledge of the language. He died in that colony in the summer of last year.

His eldest son is an accomplished young lawyer at Copenhagen.

Sir JOHN V. P. JOHNSTONE, Bart., many years the respected Member of Parliament for Scarborough, who recently died from the effects of a fall in the hunting field, was one of my oldest and most valued friends. He was a judicious patron both of science and the fine arts, inasmuch as by his aid William Smith, the father of English geology, was, during some of his aged years, comfortably supported; whilst the now celebrated sculptor, Noble, when in his youth, was kindly fostered and encouraged by him. The first of these, when acting as Sir John's land agent, constructed a geological map of his beautiful estate of Hackness, near Scarborough, which remains as a model to convince all country gentlemen that the farmer must always be indebted to the geologist; and my friend Mr. Noble has more than once spoken to me in the warmest terms of gratitude towards his earliest patron. A member of the British Association for the Advancement of Science from its foundation at York in 1831, where, as the son-in-law of the venerable Archbishop Vernon Harcourt, and the brother-in-law of its eminent founder, the Rev. William Vernon Harcourt, he was of real service to us. He was subsequently one of the active originators of the Royal Agricultural Society of England, in the management of which he played a conspicuous and useful part. Few men of this age were more beloved than Sir John Johnstone, who was ever recognised as a warm-hearted, liberal, and enlightened country gentleman by very many devoted friends, and by the men of all classes in the county of York, who deplored his death.

Besides those Fellows who have made some mark in Geography or the associated sciences, the Society has lost the following Associates:—

Lords ASHBURTON and CALTHORPE, the first an elegant scholar, and the brother of our former President; the other a man of high character, and justly esteemed for his great philanthropy and truly religious conduct.

Sir WILLIAM CLAY, Bart., many years a Member of Parliament, and once holding the office of Secretary to the Board of Control; he was also the author of good works on Finance.

From among the other deceased Fellows I single out the name of my old and valued friend, Mr. EDWARD MAJORIBANKS, the widely known and universally respected senior partner in the house of Messrs. Coutts and Co., who died in his 90th year, after a wise and well-spent life.

The remaining list of deceased Fellows is as follows:—Mr. John Arthur, Mr. Charles Bell, Mr. Charles Coote, Captain Roderick Dew, R.N., C.B., an enterprising naval officer; Commander C. R. Egerton, R.N., Mr. William Ewart, during many years a useful and laborious Member of Parliament; Mr. Anthony L. Fisher, Mr. Richard Fort, Mr. John Griffith Frith, Mr. George H. Fitz-Roy, Mr. A. Gibson, Sir William H. Holmes, of Demerara, who held public offices in British Guiana; Major G. A. James, Mr. J. M. Laurie, Mr. H. L. Long, Mr. George W. Lenox, Mr. George Macfarlan, Mr. Colin W. Macrae, Dr. Samuel Osborn, Mr. T. V. Robins, Mr. G. M. Robinson, Mr. John Smith, Mr. James Simpson, Mr. Charles John Tindal, Mr. Nash V. E. Vaughan, and Mr. Robert Walker.

ADMIRALTY SURVEYS.*

The hydrographical surveys under the Admiralty have progressed very satisfactorily during the past year, both at home and abroad: and, in addition to the ordinary results of these surveys, great advances have, through them, been made in our knowledge of the character of the sea-bottom at its greatest depths, which both in the interests of submarine telegraphy, and as throwing a light on subjects connected with physical science, hitherto not altogether clear, have been received with general satisfaction. It is further hoped that a cultivation of such investigations may be attended with still further discoveries of practical utility as well as of scientific interest.

The researches of Dr. Carpenter and Professor Wyville Thomson on the subject of sea-bottoms and temperatures at considerable depths between the Hebrides and the Faroe Isles, which were carried out in H.M.S. *Lightning*, placed at their disposal by the Admiralty for a portion of last summer, have proved of such special interest as to lead to a further investigation of a more extended character to be undertaken during the present year.

The interesting results of the former expedition have been described by Dr. Carpenter in a preliminary Paper, and published in the Royal Society's 'Proceedings,' vol. xvii., No. 107.

Home Coasts.—The examination and rectification of the Surveys of the Coasts of the United Kingdom are, with one special exception, confined for the present to the force under Staff-Commander E. K. Calver, in H.M.S. *Porcupine*, which, during the past year, has been principally employed in making a very minute and critical survey of the River Medway, on a scale of 20 inches to the mile, between the Dockyard at Chatham and Okehamness, with the view of affording reliable data in connexion with the deepening of that river, and the great Government works in progress there.

Staff-Commander Calver has also surveyed the South Bay of Wexford, for the purpose of testing its capability as a site for a harbour proposed in that narrow portion of the Irish Sea, which, owing to the dangerous and impracticable character of the entrance to Wexford itself, is much to be desired for commercial purposes; a re-survey has likewise been made of several of the off-lying shoals on the Suffolk coast, and of a portion of the entrance of Harwich.

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* By Capt. G. H. Richards, R.N., F.R.S., Hydrographer to the Admiralty.

Portsmouth Harbour and Spithead.—This special survey is being carried on by a small party under Staff-Commander D. Hall, by means of boats; it comprises a very elaborate examination of the whole harbour on a scale of 30 inches to the mile, which had become necessary, both on account of the extension of the dock works, as well as with a view to removing some of the many banks which obstruct the waters of this our principal naval arsenal, the entrance to which has been so greatly improved by dredging during the past few years; good progress has been made with this survey, as well as a re-examination of Spithead, in connexion with its re-buoyage, and the publication of a larger plan of its anchorage than hitherto existed.

Channel Islands.—This survey is being conducted by Staff-Commander J. Richards and one assistant, with the means afforded by the vessels employed in protecting the fisheries, and by the aid of boats; during the summer of 1868 the northern portion of the Minquiers Reef, and other dangers between Jersey and the coast of France, have been surveyed. The channels northward and southward of Jersey, as far westward as the meridian of the Roches Douvres have also been sounded, and several new dangers discovered and placed on the charts.

It is hoped that the survey of these islands, the dangerous and intricate character of which has called for the most able and vigilant research on the part of the officer conducting it during several years, will be brought to a close at the end of this season, and that the results will leave nothing to be desired on the part of the navigator.

Mediterranean.—It was stated in the last yearly Report that the *Hydra*, in which vessel this survey was being conducted by Captain Shortland, had been called away to obtain deep soundings for the submarine cable between Aden and Bombay. After successfully completing this service, an account of which has been written by Captain Shortland and published by the Admiralty, the ship returned to England, bringing a consecutive line of deep-sea soundings from the Cape of Good Hope by St. Helena to the English Channel. The greatest depth obtained on this line was about 200 miles southward of St. Helena, at 2800 fathoms, and this is believed to be the deepest reliable sounding on record, a considerable quantity of the bottom having been obtained and preserved.

The *Hydra* was replaced in the Mediterranean by the *Newport*, a small screw-steamer under Commander G. S. Nares, whose first duty was to survey the line for the submarine cable between Malta and Alexandria, and then to escort the cable-ship while submerging the cable; both of which duties were successfully performed. The greatest depth on this line was found to be 1840 fathoms.

The *Newport* has since completed the survey of the western portion of Sicily, preparatory to extending the soundings across the volcanic region of the Adventure Bank to Tunis, and satisfactorily determining the position of the various banks which lie between Sicily and the African shore. The roadstead of Melazzo, at the entrance of Messina Strait, and the harbour of Syracuse have also been surveyed.

Strait of Magellan.—The *Nassau*, Captain R. C. Mayne, C.B., has completed the eastern portion of this strait from Cape Virgin to the Chilian Settlement, Punta Arena, which has been published by the Admiralty in two sheets, on a good navigating scale.

The inner channels between Port Tamar and the Gulf of Peñas have also been generally examined. Several new anchorages have been discovered and surveyed, which will be of great advantage as stopping-places for steam-vessels bound into the Pacific by these inner waters. All the intricate portions of the channels, such as the English Narrows, Victory Pass, and the channel between Long and Summer Islands, have been examined and charted on good scales.

In the latter passage not more than 33 feet at low water can be commanded over the ridge which joins the two islands, and the width here is not over three cables' length, or 600 yards; sufficient, however, in the smooth water of these regions, for the heaviest ships at present in existence.

In the western portion of the Strait itself a general examination has been made of both shores from Cape Pillar to Port Famine, resulting in the discovery of some safe anchorage for the largest ships—a want hitherto much felt, and resulting but lately in the total loss of a fine steamer, the *Santiago*, belonging to the Pacific Steam Navigation Company, which struck on a rock off that inconvenient and unsafe port "Mercy Bay," hitherto the only known anchorage available at the western entrance.

During the season when the severity of the climate prevented the *Nassau* from working in these tempestuous regions, she was usefully employed on the western coast of America, and surveyed the bays of

Coquimbo and Herradura—a want much called for by the increasing trade of these ports. On returning south from Chiloe, the *Nassau* passed inside that almost unknown group of isles in the Chonos Archipelago, and again into the Pacific by the Darwin Passage, the navigation of which was found available for vessels of any size.

The *Nassau* is about to return to England after a somewhat short but very arduous service of three years, during which her officers have added much to our knowledge of that most convenient route for steamers between the Atlantic and Pacific Oceans, and left, indeed, nothing to be required by the navigator but that care and vigilance which, under even the most favourable circumstances, is imperatively necessary in such a region of storms.

North China and Japan.—This region is considered to include all the coasts of China and Japan north of the parallel of Hong Kong, and its examination is being carried on by the officers of the *Sylvia*, under Commander E. W. Brooker.

As, however, we possess very fair surveys of the coast of China itself, between Hong Kong and the entrance of the Yang-tsze River, the object has been to confine, as far as possible, the labours of the *Sylvia* to making such an impression on some portion of the coast of Japan as would probably lead to a systematic and consecutive survey of its extensive shores. Owing, however, to the increasing commerce and consequently increasing demands of navigation at points widely distant from each other, to the actual physical changes that are taking place at the entrances of the great rivers of China, and to the frequent calls that are made on the surveying officers to search for some reported danger, often imaginary, or to report on some special subject to some special authority, it has been found difficult with a single vessel to follow out this object, and the consequence has been hitherto that we have been what may be called tinkering at Japan, and the valuable work which the surveyors have obtained has, from its fragmentary character, not been as available for present use as it would have been under a different system. During the past year, however, very considerable progress has been made in the direction pointed out, and a good survey has been made of the coast of Kui-sui (the southern island) between the port of Nagasaki, through Spex Strait, as far as the entrance of the Strait of Simonoseki. The actual distance between these points is but 120 miles; but the broken character and deep indentations of the shore extend the actual survey to over 500 miles. In November, 1868, the *Sylvia* was called away from Japan and crossed over to the

Great Yang-tsze Bank to search for a shoal reported on its outer edge, 120 miles from the Lightvessel at the entrance of the river. The danger, however, was not discovered, nor did the examination in any way indicate the probability of its existence.

On her way to the south, a re-survey of the channel and banks at the entrance of the River Min was executed, where great changes were found to have taken place since former surveys of 1843-54; and a system of buoyage was proposed to the Chinese authorities which, if adopted, will greatly facilitate the navigation of the river, on the banks of which, about 35 miles within the entrance, stands the important city of Foo Chow.

The *Sylvia* has returned to resume her surveying duties in Japan, and will proceed with the examination of such parts of the coast as will be of most interest to commerce and navigation. Hitherto this country has borne almost exclusively the burden of opening up the boundless resources of the extensive and flourishing empire of Japan by its explorations and surveys; and the many casualties which have occurred, and may be expected to occur, not only among the mercantile marine but to our ships of war, for the want of correct charts, would appear fully to justify the employment of one small vessel on such useful work. At the same time, looking to the enlightened progress of the Japanese themselves, and the aptness they have shown for acquiring the knowledge and modern appliances possessed by the civilised nations of other countries, it is reasonable to hope that the time is not distant when we may expect them to co-operate, or to take a leading part, in a work so necessary as the correct delineation of their own shores, and of the dangers and obstructions which at present render the approach to them, in many cases, attended with difficulty and risk.

The China Sea Survey.—Under this name is included that extensive region lying between the parallel of about 4° s. and that of Hong-Kong in about 22° n.; bounded on its west by the eastern shores of Sumatra, the Malay Peninsula, and China; on its east by Borneo and Palawan; and comprising within it those numerous islands which form the various channels into the China Sea south of Singapore; and the innumerable coral-reefs which encumber the China Sea proper, and divide it into the two great highways through which the commerce of the West passes to Hong-Kong and the north.

The making of these paths clear, and the opening up of the ports of China to the vast commerce which now pours into them from all parts of the world, has been the patient but persevering work of the navy of this country for thirty years.

Commenced in war and continued in peace, well may it have been considered a gigantic task to which no end could be seen when first undertaken; and yet the end, so far as this great area is concerned, may now be clearly and definitely counted upon. And when it is remembered that never more than two, and frequently not more than one, of the smallest class of vessels in the navy have been consecutively employed on this great work; and when the results are considered, the price which it has cost in money will scarcely be considered an excessive one: nor will the labour, and energy, and ability which has been devoted to it be deemed to have been ill-bestowed.

The survey is at present being conducted in H.M.S. *Rifleman*, under Staff-Commander J. W. Reed. During the past year the examination of the reefs which form the eastern edge of the main passage from Singapore to Hong-Kong have been completed, as also some others in the Palawan Passage; and both these routes may now be considered as sufficiently known to ensure the safety of navigation with ordinary caution.

The survey of Balabac Strait, between Borneo and Palawan, together with the Island of Balabac * and Balambangan, is also well advanced; and here the *Rifleman* is now employed. When this work is completed, the route eastward of Palawan to the Philippines and the coast of China during the adverse monsoon will be made safe; although the Sulu and Celebes Sea, with Macassar Strait, will still remain a nest of dangers for future exploration.

During a visit to the Gulf of Siam the position of some doubtful dangers were searched for and found not to exist, and have consequently been expunged from the charts.

The *Rifleman* has also made very considerable additions to the survey of Singapore Strait, by which the chart of that neighbourhood has been much improved and 30 miles of the Malay Peninsula northward of Singapore has been re-surveyed and sounded.

Staff-Commander Reed and his officers availed themselves of the opportunity of observing the total eclipse of the sun, which occurred on the 18th August, 1868, and for this purpose visited Baram Point, on the west coast of Borneo. He was accompanied by Mr. Pope

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* One of H.M. ships has been totally lost on the dangerous reefs to the westward of this island since the survey commenced last year, and the *Rifleman* herself grounded during the prosecution of the work and narrowly escaped shipwreck.

Hennessey, the Governor of Labuan, who went for the purpose of making similar observations, and which were very successfully obtained. The *Rifleman's* observations were communicated to the Royal Society.

Before quitting the China Seas, it will not be out of place to mention that extensive surveys of the Philippine Isles and seas adjacent are in course of progress by a Hydrographic Commission, under the conduct of Captain Claudio Montero, of the Spanish Navy, through whose co-operation with Staff-Commander Reed, and courtesy in sending to this Department copies of his surveys immediately they were made, very valuable additions and corrections have been made in the Admiralty Charts of these regions.

West Indies.—Staff-Commander Parsons, with his two assistants, have been principally employed during the past season in making an accurate detailed survey of the island of Barbadoes, which will be completed during the present year. Hitherto no survey worthy of the name had existed of this small but flourishing and valuable island, and more than one serious accident and shipwreck had of late occurred from want of correct charts.

The surveyors in the West Indies have been several times diverted from their ordinary duties during the last season to examine whether any material changes had been caused by the earthquake-wave of 1867, which does not appear to have been the case; and surveys of Virgin Gorda and its approaches have been made in reference to its capabilities as a packet-station.

NEWFOUNDLAND.—Staff-Commander J. H. Kerr and his two assistants have surveyed 200 miles of coast-line and sounded over 700 square miles in the vicinity of Cape Freels and Togo Island, on the east coast. The dangerous character of the shoals, which extend far off this coast, render it very necessary that they should be well defined on the charts, especially since—in consequence of the decline of the fisheries on the Newfoundland coast—the traffic to the Labrador grounds is so much increased; and to which this route is the high-road, both for the fishery vessels and the ships of war which are employed in their protection.

Staff-Commander Kerr has likewise completed the survey of Conception Bay, and determined several astronomical positions round the entire coast, with a view to the construction of a new series of charts to supersede those of the last century.

BRITISH COLUMBIA.—The surveying party in this colony, under Staff-Commander Pender in a hired vessel, have been employed in examining and making clear the channels between the northern end of Vancouver Island and the British boundary in 54° 40′ N.; 900 miles of coast have been so examined, 150 miles of which have been exposed coast, at all times difficult and hazardous to effect a landing upon. Portland Inlet, through the centre of which runs the boundary between the British and lately acquired territory of the United States, has been surveyed and found to extend 11 miles farther north than shown on the old charts. Several new anchorages have also been found and surveyed on the main route between Vancouver Island and Fort Simpson, the northern boundary.

CAPE OF GOOD HOPE.—Navigating-Lieutenant Archdeacon and his assistants have, during the past year, completed the survey of the eastern coast of the colony to the Bashee River, about 150 miles short of Natal; when, in consequence of negotiations pending between the Colonial Government and the native tribes east of the Bashee, it was considered desirable not to pursue the work further at present, and the party were consequently removed to the western coast of the colony, which they have surveyed as far north as Saldanha Bay, and found many errors in the old charts. They are now continuing the work northerly, and a survey of Saldanha Bay together with a re-survey of False Bay are in progress.

AUSTRALIA.—*New South Wales.*—The re-survey of the seaboard of this colony from Cape Howe in the south to Danger Point in the north, embracing a distance of about 600 miles of latitude, has now been completed; and its numerous ports and anchorages surveyed with all the accuracy necessary for ocean navigation, or indeed for any purposes. At the present time the officers are obtaining the off-shore soundings and other data necessary to render the charts complete, and at the close of the present year the Admiralty Survey of New South Wales will be complete, and the officers withdrawn. The survey was commenced by Captain Sidney in the year 1861, and is now under the conduct of Navigating-Lieutenant J. T. Gowland, Captain Sidney having retired in 1868, after a long and meritorious service of 34 years, during which he was constantly engaged in surveying duties in various parts of the globe.

Victoria.—Navigating-Lieutenant Henry J. Stanley with two assistants have, during the past season, been employed in surveying the coast of this colony between Cape Schanck and Wilson's Promontory, and plans of the bays and anchorages within these limits have been made on scales suitable for navigation. A re-survey of the entrance to Port Phillip has also been completed.

The southern shores of Australia are much exposed, and generally difficult to land upon in consequence of the heavy surf almost continually rolling on the beach. More extended means are, therefore, required to carry on the work, nor can it be expected to proceed with the same rapidity and uniformity which has been found practicable on the more sheltered coasts of New South Wales and Queensland.

South Australia.—During the year 1868 the eastern shore of St. Vincent Gulf has been examined from Adelaide to Cape Jervis, thus completing the survey of the whole of this extensive gulf. The outer coast eastward, from Cape Jervis to 30 miles beyond the Murray River, has likewise been surveyed.

Captain Hutchison having been promoted, the charge of the survey is now in the hands of Navigating-Lieutenant F. Howard, who is continuing it with one assistant.

Queensland.—Navigating-Lieutenant E. P. Bedwell and an assistant have surveyed the coast of Queensland from Moreton Bay to Indian Head, or nearly to Sandy Cape, a distance of 130 miles, and have carried the soundings to a distance of 15 miles from the shore. This is a very important addition to our knowledge of a part of the coast hitherto entirely unsurveyed. Wide Bay and the bar to the entrance of Great Sandy Strait, with the southern portion of the strait itself, have also been sounded.

H.M.S. *Virago*, which is principally employed on the coast of Queensland in the channels inside the Great Barrier between Sandy Cape and Cape York, has a surveying officer—Lieutenant Armit—attached to her, who loses no opportunity which circumstances afford him of adding to the charts of this region, some portions of which are still very imperfectly known.

Auxiliary Surveys.—Commander Chimmo and the officers of H.M.S. *Gannet* were employed during the early part of 1868 in completing the survey of Trinidad and the approach to the Gulf of Paria; and subsequently in defining the deep limits of the banks south of Newfoundland, and searching for some off-lying shoals which were supposed to exist; likewise in investigating the phenomena of the Gulf Stream; and, finally, in carrying a line of deep-sea soundings across the Atlantic; in all of which researches they added considerably to our knowledge, and Commander Chimmo's investigations formed the subject of a paper which was read before the Royal Geographical Society.

H.M.S. Serpent.—Commander Bullock having been directed in

1868 to proceed from Japan to the Java Sea, for the purpose of obtaining deep-sea soundings to facilitate the laying of a submarine cable between Australia and Java, he accordingly left Japan in May, 1868, and, proceeding eastward of the Philippine Isles, touched at Mantawalu Kiki in the Gulf of Tomini, Celebes Island, where the total eclipse of the 18th August, 1868, was observed by the officers of the *Serpent*, and also by professional astronomers from Manilla, whom Commander Bullock had brought from thence for the occasion, the results being communicated to the Royal Astronomical Society. From here the *Serpent* proceeded to Amboyna, and thence to Koepang in Timor, in the neighbourhood of which some slight surveying operations were performed; and a line of deep soundings was then carried south of the Isles of Flores and Sumbawa, through Bali Strait to Pampang Bay, on its western shore, a detailed plan of which was made as a terminus for the shore-end of the cable. The result of this survey proved that a moderate depth of water—not more than 1800 fathoms—existed along the proposed line, and that it was a suitable route for a cable.

After refitting at Singapore, the *Serpent*, taking her departure from Penang, carried a deep line of soundings across the Bay of Bengal to Point de Galle, at the south end of Ceylon, the greatest depth found being 2200 fathoms.

Summary.—During the year 1868, Sailing Directions have been prepared and published for the West Coast of Africa from the River Cameroon to the Cape of Good Hope; and for the Bristol Channel, between Hartland Point and St. Ann's Head.

The 'North Sea Pilot,' Part IV., has also been revised, and various Hydrographical Notices, containing the latest information of the coasts of China, Japan, the Straits of Magellan, &c., have been brought out.

The usual Tide Tables and Lists of Lights have been published, and 146,500 copies of Admiralty Charts have been printed for the use of the royal navy and the public.

Fifty-one new Charts have been engraved, exclusive of a series of Pilot Charts for the Atlantic Ocean, explanatory of the winds, currents, and other ocean phenomena for the different seasons of the year.

NEW PUBLICATIONS.—*Tchihatcheff's* '*Asie Mineure.*'—My distinguished friend, M. Pierre de Tchihatcheff, who, during eight years of personal researches and nearly twenty years of scientific and literary labours, made Asia Minor his special domain, has completed his indefatigable labours by two volumes on the secondary and tertiary rocks of that classical region. It is, indeed, fortunate that such a character as Pierre de Tchihatcheff should, however rarely, stand out in striking relief among those men of independent means who enrol themselves in the army of science. The labours of many years, the large expenditure of money, and the risk of life, which he has incurred, in evolving with untiring zeal, the geography, botany, natural history, and geology of the vast country of which our former President, William Hamilton, gave us the first general outline, merit our warmest acknowledgments. Let me further say that I commend these volumes for being not only full of good matter, but as being written in the most pleasing and attractive style. I also specially admire M. de Tchihatcheff for the gallant declaration he makes in his last preface, when he announces that, after all his labours, it is not as an invalid in repose that he takes leave of his readers in offering them his eight volumes on Asia Minor,* with his maps, both geographical and geological (to say nothing of his numerous other publications, including his Geology of the Altai Mountains), but as a still vigorous pilgrim, who, being once more on foot, solicits their encouragement and approval as he enters on some new crusade. The man after my own heart is one who, like Pierre de Tchihatcheff, is always struggling onward; and I only regret that my own term of life is so much further advanced than that of my distinguished friend, that I cannot longer expect to make any more of those explorations which it has been the happiness of my life to pursue, in my endeavours to extend, like him, geological and geographical knowledge.

The eulogy of Pierre de Tchihatcheff which the lamented and truly eminent geologist le Vicomte d'Archiac wrote in a letter to me is so true and apposite that I give it here, as being also my own estimate of the value of the works. "I hope," writes D'Archiac, "to be able to show that his works on Asia Minor constitute one of the most remarkable and vast scientific monuments of our age; for among all explorers of unknown lands no one can boast of having, like him, produced such detailed and precise works on all branches of natural science, after traversing in every direction and step by step, during ten years, a wild and difficult region as large as France; and what is more, all this by himself alone, without the material or moral assistance of any Government, scientific body, or association, and entirely at his own cost."

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* 'Asie Mineure; Description physique de cette Contrée.' Paris. Guérin, éditeur. (Théodore Morquand, 5, Rue Bonaparté.)

*Whymper's 'Alaska.'**—Of the several works describing distant tracts which have appeared in the past year, none has interested me more than the narrative of the travels and adventures of Mr. Frederick Whymper, in the territory of Alaska and along the course of the great River Yukon. Russian America (now acquired by the United States), though very imperfectly known even to geographers, and almost entirely unknown to the general public, has, thanks to the zeal and enterprise of Mr. F. Whymper, been most graphically described. He has given us an animated description of the vast tract of country watered by the great River Yukon, including many good statistical and geographical data, with sketches of its stalwart Red Indian inhabitants, the whole illustrated by some most effective woodcuts and a very instructive map. Besides the description of the great Alaska and Yukon territory, the author's observations on Vancouver Island and the Archipelago of Behring's Sea present to us in a compact and attractive form much fresh and valuable information. The volume further recommends itself to the reader by a good sketch of the physical outlines of Kamschatka and its lofty snow-covered volcanoes, with an account of the discoveries of Behring and his fate. All the natural phenomena in that region of auroras and wonderful meteorological changes are explained, and the work terminates with a lively description of life as it now exists in California. By it we learn that the unfavourable picture drawn of this virgin country by early emigrants has been entirely changed; and through its settlement by our energetic kinsmen, this prolific region, enjoying a splendid climate, has been rendered eminently productive of all cereals and of the most delicious fruits, which, like the hidden precious metals, simply required the industry of man to be brought forth in abundance.

Delesse's 'Carte lithologique des Mers de France.'—An original and instructive map has recently been published in France by the accomplished Chief Mining Engineer, Professor Delesse, entitled 'Carte lithologique des Mers de France.' By applying four different tints of light colours to different parts of France, Belgium, and the South of England, the author indicates the portions of those dry lands which shed their waters respectively into the Ocean, the Mediterranean, the Bristol Channel, and the German Ocean.

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* 'Travels in Alaska and on the River Yukon.' (Murray. 1868.)

Then, by other colours, he shows the varied nature of the sea-bottom for a considerable distance off the coasts of these countries; marking, at the same time, by a series of contour-lines, the elevations of land and the depths of the sea. Thus, it may be seen at a glance how narrow is the belt of shallow sea along the Mediterranean coast of France, and how wide is the shallow border-zone around the Atlantic coasts both of France and England. The different mineral character of areas of the sea-bottom is marked by different colours in a clear and instructive way. Shelly deposits, of great service to the farmer, are seen to be connected with calcareous or granitic shores like those of Normandy and Brittany, and to be rare on coasts where argillaceous deposits or sterile sands, like those of the Landes, prevail. This map also indicates, by horizontal curves, the true orography of France and its surrounding hydrographical basins, and also the amount of rainfall, the direction of winds and currents, and the propagation of tides. In short, as a lithological map of the seas around France, this work—which can be consulted with great advantage by seamen and engineers employed in submarine works, as well as by geologists, zoologists, and agriculturists—will prove a valuable help to students as well as to practical men.

Neubauer's 'Geography of the Talmud.'—One of those learned works which make but little stir in the world on their first appearance, but which are found to be of permanent utility to all earnest students, is the 'Geography of the Talmud,' by Adolphe Neubauer:* a work which gained a prize offered by the French Academy for the best treatise on the subject. While Reland and Lightfoot made very sparing use of the geographical remarks of the Talmudistic books concerning Palestine, M. Neubauer enters into them profoundly; and he gives, from the same ancient records, some interesting facts relating to Babylonia and Mesopotamia which have not hitherto been noticed by historians or geographers. The work itself is one of great learning and minute research; but it contains a preface, written in a clear and agreeable style, which gives a summary of the literature of the Talmud and forms an excellent general introduction to the subject.

Wallace's 'Malay Archipelago.'—Since the days when my lamented friend, John Craufurd, made the English public well acquainted with all the leading geographical and statistical features of the

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* La Géographie du Talmud, Mémoire couronné par l'Académie. Ad. Neubauer. (Paris, M. Levy Frères. London, Williams and Norgate.)

Indian Archipelago, the most remarkable work which has been published is that which has just appeared from the pen of our Associate, that eminent naturalist Alfred Russel Wallace.* As we took an interest in Mr. Wallace's expedition when first planned by himself, and received from time to time papers from him on various portions of his travels, we may well feel a pride in his great success, and in the striking contributions to various departments of science which have been the result of his eight years' wanderings.

As Mr. Wallace justly observes, the vast group of islands extending from Sumatra to the islands east of New Guinea are equal in the extent of surface which they cover to one of the primary divisions of the earth's surface, although the region in most maps is almost ignored as a geographical whole, being divided between Asia and the Pacific Islands. The Malay Archipelago extends for more than 4000 miles in length from east to west, and is about 1300 in breadth from north to south. Its area is equal to that of all Europe and great part of Western Asia combined, and some of its islands are larger than France or the Austrian empire. The region, moreover, is exceedingly diversified, both in physical features and in animal and vegetable productions. One of the chief volcanic belts upon the globe passes through the archipelago, and produces a striking contrast between the scenery of the volcanic and non-volcanic islands. The organic productions are, to a great extent, peculiar, and remarkable for the beauty of their forms, and, in the case of the fruits and spices, their value to mankind. The task which Mr. Wallace set before him was to visit all the principal parts of this great equatorial region and explore its physical geography and natural history—a task which employed him during eight years from 1854 to 1862.

The result of Mr. Wallace's researches which chiefly interests us as geographers is the establishment of a natural division between the eastern and western portions of the archipelago; a sketch of which, with the principal facts and reasonings leading to it, was given by him in a remarkable paper read before us soon after his return, in June 1863. The first suggestion of this division seems to have been supplied by the animal productions, which are so widely different in the western and eastern halves of the Archipelago, the great islands of Sumatra, Java, and Borneo, on the one hand, containing the elephant, rhinoceros, wild cattle, and a vast number of genera and species of mammals and birds allied to, or identical with, those of Continental Asia, whilst New Guinea and the Moluccas are destitute of all these Asiatic forms of life, and, in their stead, contain numerous genera of Australian types. The two faunas thus wonderfully contrasted nearly meet at a central line, which runs north and south along the channels between Borneo and Celebes, and between the small islands Bali and Lombok in the Java Sea. Between the two islands last mentioned the channel is only 15 miles wide, yet the two sides of this narrow strait differ as essentially in their animal life as Europe does from America.

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* 'The Malay Archipelago; the Land of the Orang Utan and the Bird of Paradise.' 2 vols. (Macmillan and Co. 1869.)

In establishing this division Mr. Wallace applies the same principle which is followed by some European geologists and naturalists, in working out the relations of animal life and their bearings on the former geological connexion of countries now separated by the sea; for example, in the case of the British Islands and the continent of Europe. The fact that our islands are peopled by animal and vegetable forms, with few exceptions identical with those of the neighbouring continent, led, in the first place, to the conclusion that they were united by land at a period not further remote than the peopling of North-Western Europe by its present species of organic beings; and this hypothesis has now been confirmed in a remarkable manner by geological investigations of post-tertiary deposits, which prove that this connexion must have existed. The shallowness of the intervening sea is also accepted as an argument in favour of the recent union of these land areas. Mr. Wallace assumes, with many other eminent naturalists, that this principle may be carried further, and that when the terrestrial animal productions of islands, or islands and their neighbouring continents, are dissimilar from each other, it may be concluded that there has been no connexion between them in recent geological times. It must be allowed that some facts lend great support to these conclusions; for example, it is found that where there is great dissimilarity in the organic forms between lands compared in this manner, they are usually separated by a deep sea instead of a shallow one; and, if all geological changes had been slow, the depth to which the sea-bed had sunk might be taken as a kind of rough measure of the lapse of time. Applying this test to the Malay Archipelago, Mr. Wallace has found that the seas lying between the great islands of Borneo, Java, and Sumatra (in short, all the islands having Asiatic forms of life), and the Asiatic continent, have a maximum depth of not more than 50 fathoms: and, at the other extremity, New Guinea and the neighbouring islands are connected with Australia by a similar shallow sea. The space, however, between these two areas of lands and shallow sea is occupied by a very deep sea, and the Australian types seem to diminish in numbers, in advancing westward from New Guinea, as we approach the channel that divides the "Austro-Malayan" from the "Indo-Malayan" portions of the archipelago.

For the details of this remarkable subject, which unites the science of Geography with those of Geology and Natural History, and also for the curious speculations on the modifications of species, I must refer you to Mr. Wallace's book. So well has he elaborated his leading generalization, and so thoroughly has he made it his own, that already other writers are beginning to term the dividing channel between the two halves of the archipelago "Wallace's line." In addition to this ingenious speculation, the two volumes contain a store of interesting and important facts relating to the physical geography of the various portions of the archipelago, and to the native inhabitants, climate, and productions of the remote islands which he visited.

Much, however, as Mr. Wallace is to be admired as a great naturalist and a most attractive writer, I cannot, as an experienced geologist, subscribe to his assumption that *all* former changes of the outline of the earth were produced slowly. On the contrary, it seems to me that the profound chasm which he describes as existing between the islands of Bali and Lombok has more probably resulted from one of those deep and sudden ruptures of the crust of the earth which the field geologist meets with so very frequently. It would, indeed, require a detailed examination of the cliffs and shores of these opposite islands (a point on which the author is silent) before we can refer the enormously deep channel which separates them to the ordinary action of a marine current during countless ages. Having, at our last anniversary, endeavoured to combat the doctrine of uniformity of causation through all time, I will follow up the subject towards the end of this Address by comparing some of the present with the former changes of the earth's surface.

Bickmore's 'Travels in the East Indian Archipelago.' *—In reference to this region, it also gives me pleasure to call attention to the well-filled volume thereon by Mr. Albert S. Bickmore. This accomplished young American traveller, who, after an absence of four years from the United States, gave us on his way homeward a very lively and attractive sketch of his journey across a large portion of China,[*] between Canton and the River Yang-tsze Kiang, of which we had no previous description, has recently published a work, giving a full account of that portion of his wanderings relating to the Indian Archipelago.

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* 'Travels in the East Indian Archipelago.' By A. S. Bickmore. (Murray. 1868.)

Besides the talent of describing, in a clear and entertaining manner, the people and their customs, particularly as regards Sumatra, of which region we had previously very little knowledge, Mr. Bickmore has really great merit as a naturalist; the chief object of his voyage having been to collect the rare shells of Amboyna, first figured and described by Rumphius—adding considerably to the number of species, and so enriching the museums of his native land that his countrymen have most properly rewarded him by making him Professor in one of their Universities. He has also received an important post in connexion with the proposed new State Museum of New York, towards which the Legislature has lately voted a large sum of money, and which is to occupy one of the best positions in the city, at the Central Park.

One fact mentioned by this author, in describing the Minahasa district in the Celebes, is very creditable to the labours of the missionaries. But a few years ago the people of this tract were notorious cannibals; they are now greatly civilised, and, in having been taught to read and write, and adopt the precepts of Christianity, all their bloody sacrifices have been abandoned. Thus, whilst in 1840 one only out of sixteen of the inhabitants was a Christian, now the relation is as two to five. Besides these and many other descriptions of the people for the general reader, the geologist will find much to interest him in Professor Bickmore's account of some of the phenomena of that region of earthquakes and volcanoes.

Keith Johnston's '*Elementary Atlases.*'—These cheap Atlases, which I noticed in my last year's Address, continue to be published by our talented and enterprising associate Mr. A. Keith Johnston. I have before me, at the present time, three of the physical maps forming part of the series; two illustrating the physical geography of the Mediterranean Basin, and the other the Currents of the Ocean. The execution of these small maps, in which so much information is conveyed by means of colours, contour lines, and shading, is admirable, and their author is entitled to all credit for placing such means of geographical instruction within the reach of even the poorest classes.

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[*] See 'Proceedings,' vol. xii. p. 51.

Fullarton's 'Hand Atlas.'—Messrs. A. Fullarton and Co. have commenced the publication of a new collection of Maps, with descriptive letter-press, under the title of 'A Descriptive Hand-Atlas of the World,' edited by J. Bartholomew, F.R.G.S. This work, of which four parts have appeared, seems to me to contain much geographical information in a convenient form, useful not only to the geographer but to the student of other branches of science and to merchants. One of the maps illustrates all the principal physical phenomena of the earth's surface, and the distribution of races and religions. The other more detailed maps are remarkable for the clearness of their execution.

ARCTIC RESEARCHES.—Having on various occasions dwelt upon the progress annually made in North Polar explorations, it was my duty at the last anniversary to direct special attention to the effort then about to be made by the Germans, as incited and guided by our medallist, Dr. Petermann, to advance into the Polar basin by the eastern and north-eastern coast of Greenland. Although the result was not commensurate with the anticipation of the designer, yet the advance was notable when we reflect upon the fact that the little Norwegian schooner, the *Germania*, under many adverse circumstances, reached so high a latitude as 81° 05′.

While such was the endeavour on the east coast of Greenland, the Swedish Government, following up the spirited efforts it had made, to its great honour, since 1861, fitted out a well-formed scientific expedition, to develop the natural history and physical geography of the western and northern shores of Spitzbergen, and, further, to endeavour to penetrate northwards from Spitzbergen towards the Pole. It must be recorded that the initiative in these remarkable Swedish Arctic explorations was made by M. Otto Torrell, in 1858, who visited, in that year, the western parts of Spitzbergen, in company with M. A. E. Nordenskiöld, on board a hired yacht. This expedition was chiefly engaged in Natural History researches and Geographical explorations. The general physical investigation was only commenced in the Government expeditions of 1861 and 1864, the latter under the command of M. Nordenskiöld. The endeavour to navigate the icy sea towards the Pole was a new feature in the expedition of 1868, and the plan of it was quite original, inasmuch as this effort was not to be made before the autumn, *i. e.* in the season when former expeditions had ceased their labours. The grounds were, that it was to be inferred that, at this period of the year, the effect of the summer sun in melting and dissipating the ice-floes would have produced its greatest results, and that then, if ever, a passage might be forced, to be followed by a rapid return. After reaching the latitude of 81° 42′, the highest ever yet authentically recorded as attained by any ship, the Swedish screw-steamer sprung a leak, in consequence of a shock against a huge mass of ice, and was with great difficulty saved; and, after refitting in an icy fiord, was just enabled to reach home.

The natural history results alone, which the Swedes have obtained, have in themselves well repaid the cost of their endeavours, by the copious additions made to our knowledge of the geology, zoology, and botany of Spitzbergen; the only previous exploration conducted in a similar systematic manner being the Expédition du Nord, which, in the years 1838 and 1839, the French carried out under Gaimard. But what specially calls for our admiration is that the Swedes are animated by the resolve to make another great effort, thus really taking the lead in the resolute endeavour to solve the great northern problem; and for their noble efforts in this cause, our Council have most rightly adjudicated the Founder's Medal of this year to M. Nordenskiöld.

The sketch which M. Nordenskiöld, the scientific chief of the expedition of 1868, in conjunction with the naval commander, Captain von Otter, sent to us, and which was read to our Society, has elicited the warmest approbation of naturalists and geographers; and from the data which have been already obtained we have a right to anticipate that, if it be given to man so to penetrate within the Arctic Circle as to determine the real nature of the great area around the North Pole, Nordenskiöld and his companions have a fair chance to achieve it. One great scientific merit of this Swedish enterprise has been the completion, in 1864, by M. Nordenskiöld and his assistants, of the preliminary survey for measuring an arc of the meridian in these latitudes, so long ago strenuously advocated by General Sabine. Already nearly the whole of the coasts, deep bays and channels of this group of islands have been surveyed with precision by these courageous and successful explorers, and the excellent map they have produced gives evidence of the amount of their labours.

The grand subject of North Polar survey was clearly put before the French public last year by our zealous and accomplished foreign Associate, M. Malte-Brun, in his work, entitled 'Les Trois Projets'—meaning thereby the English, German, and French propositions for advancing towards the Pole—in which he fairly examined the respective values of the schemes of Sherard Osborn by Baffin's Bay and Smith Sound, as largely dwelt upon in our Society—that of Spitzbergen, as advocated by Petermann and supported by Sabine, and that of Behring Straits, as projected by Lieutenant Lambert, of the French Navy.

As I have before treated of these questions, and also of a fourth project, or that by the east coast of Greenland, as suggested by the whaling Captain Gray, I need not now revert to them. I have, however, the truest satisfaction in announcing to the scientific world that the scheme which our Government declined to adopt is now in the act of being carried out by the spirit and at the expense of a Scottish gentleman and a Fellow of our Society.

Mr. James Lamont, member for Buteshire in the last House of Commons, who formerly explored the Spitzbergen seas and gave to the reading public an animated sketch of walrus hunting, adding also much to our acquaintance with the fauna, as well as the geology, of the Arctic Circle, left the Clyde in April in a screw-steamer of 250 tons' burthen, built, fitted out, and manned, at his own expense, with a seasoned crew of ice-men, a practised captain, and a naturalist, in which he is now making the bold endeavour to succeed, where others have failed, in penetrating further towards the North Pole.* We geographers may then rejoice in the fact that the electors of Bute should have rejected the services of Mr. Lamont, for, by losing his seat in the Senate, he has thereby been enabled to devote his zeal, ability, and purse to our cause.

I forbear to attempt to predict what the determination may prove to be respecting the real physical condition of the region around the North Pole. Whether it be for the most part a huge watery basin, from parts of which the many whales migrate southwards to Smith Sound and Baffin's Bay, or whether it be encumbered with lands, it would appear to be certain, from the fragments of rocks and earth which the Swedes have recently found floating on the ice from the north towards Spitzbergen, that in that direction, at all events, there are lands, which may be a continuation of those of Arnheim and Wrangel, which range from off the northern coast of Siberia, and were, indeed, first sighted by our own Kellett, and subsequently delineated more extensively by the captain of the American whaler, to whom I adverted in last year's Address.

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* Mr. Lamont's vessel, the *Diana*, passed through the Crinan Canal, went on successfully through the Caledonian Canal to Inverness, whence he wrote to me on the 20th April, stating that he hoped to be at Tromso on the 1st May, and would then have full four summer Arctic months at his disposal. I learn from Mr. Lamont that he will endeavour to pass by the north-east side of Spitzbergen; hoping that, if he can once reach Gillies Land, he may be able in his steamer to proceed up its west coast for a great distance northwards. His preconceived opinion, founded on the repeated failures of his precursors to effect an entrance into the ice by the north-west, is that the east side of Spitzbergen is the proper route. If he should succeed in proving that lands extend towards the Pole far beyond Nova Zembla, he will have given us important new geographical data which will materially circumscribe the area of the supposed open Polar Sea. In the mean time let us heartily applaud this spirited and noble enterprise of a Scottish gentleman.

Among the discoveries which have been made in the natural history products of the Polar Regions, none has more attracted men of science than the fact that the subsoil there contained in several parts the remains of fossil-plants of a warm climate. In their earlier researches the British Arctic Officers—of whom General Sabine is the earliest type left—collected fossils which were referred to that old carboniferous period when tree-ferns and palms flourished; and subsequently animals of the age of the Lias were also discovered. It is of late years, however, that, through the collections made in Greenland by our navigators during the search for Franklin, and subsequently by Mr. Whymper, and in Spitzbergen by the Swedish Expedition, that Dr. Heer, the celebrated botanist of Zürich, has been enabled to describe a rich flora of Miocene age, of which, even in the collection of Mr. Whymper, 95 species of plants indicative of a climate similar to South Italy have been described. Such being the fact, geologists—who ingeniously endeavoured to account for the former existence of an exuberant flora in the now icy Arctic region by an appeal solely to changes of physical geography of the lands and waters—are now dragged into the much grander cycles of certain astronomers, who endeavoured to account for the wonder by carrying us back hundreds of thousands of years, to a period when the earth, by a deviation of its axis, presented its now Arctic and Antarctic regions to the direct action of the rays of the sun.

ANTARCTIC OCEAN.—Our endeavours to induce the Government to maintain the renown of our navy in the exploration of Polar Seas, by completing the work, towards which we had already accomplished so much, namely, of determining the geography and natural history of the North Polar Region, were made, in great measure, because we well knew that in a very few years England, and indeed all civilized maritime nations, would be called upon to send astronomers to observe the transit of Venus amid the difficult and less known icy seas of the Antarctic Circle. We argued [*] (and I think most justly) that on the arrival of the time when it would be necessary to establish observatories in that region, scarcely a naval man would be left skilled in ice-navigation, or who had still the power of instructing others in it. Hence we strongly urged that we should enter upon that great and scientific Antarctic undertaking under enormous disadvantages.

That period, however, of Antarctic research is now fast approaching, and all Arctic maritime practice of the Royal Navy for North Polar purposes having been refused, we find that the preparatory arrangements for the observations of the Transits of Venus in 1874 and 1882 have already undergone, in the Astronomical Society, the luminous scrutiny of Mr. Airy, the Astronomer Royal, whose paper on the subject was followed by observations by Captain Richards the Hydrographer, Mr. H. Toynbee, Rear-Admiral Ommanney, Staff-Commander Davis, Mr. E. J. Stone, and Mr. Warren de la Rue. The geographical portion of the question has indeed been well put before our Society (in which it underwent a very animated discussion) by Staff-Commander Davis, himself an Antarctic explorer, and one of the former associates of that eminently distinguished Polar navigator, Sir James Ross.

That preparatory expeditions must be fitted out to secure the establishment of proper observatories, in order to clear up this great datum line in the physics of the universe, I must consider certain, when I quote the Astronomer Royal, who, speaking of the Expedition sent into the Pacific to observe the transit of Venus in 1769, justly says that it has ever since been esteemed one of the highest scientific glories of England in the last century. Surely then our country, largely as it has advanced in physical science in the last hundred years, ought much more strongly to feel the urgency and desirability of this new expedition. But, alas! I cannot but feel a misgiving (notwithstanding the confident hope of my valued friend the Hydrographer) as to the national endeavours which will be made, when I know that so important a branch of science as that of North Polar research, which did not carry with it the vulgar recommendation of usefulness and profit, was slighted by too many of my countrymen, with whom the common aphorism of "cui bono" is a sufficient apology for a shabby abstinence from much which would ennoble our nation.

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[*] See my Address, 1865, 'Journal,' vol. 35, p. clxxxii.

EUROPE.—*Switzerland.*—I have received, as in former years, an account of the progress of the national survey of Switzerland, from our learned and active Corresponding Member, M. J. M. Ziegler, of Winterthur. The able men of science, who have been engaged in the triangulation of this interesting portion of Europe, and in fixing by an elaborate series of hypsometrical observations and exact levellings the true profile of this rugged land in various directions, have not yet reached the end of their labours. At present it is intended to continue the topographical survey of those parts of the country whose cantonal maps are of an earlier date than 1831. To the name of General Dufour, who is so widely known in connection with the federal maps of Switzerland, must be added those of Professor Wolf and Messrs. Plantamour, Denzler, and Hirsch, who have all co-operated in the Swiss Survey. In 1867 the work of the triangulation of Switzerland, in connection with the surrounding countries, was brought to a close by M. Denzler, and the operations of the *nivellement de précision* were so far advanced that the hypsometrical network for the West of Switzerland may be considered as now terminated, embracing the districts from Geneva to Basle. These geodetical operations have become of more general geographical importance since the establishment of the International Geodetic Association for Central and Southern Europe, which a Swiss delegate always attends, and through which the surveyors of the various states are enabled to connect their work so as to lead finally to that desirable result—a perfectly accurate map on a large scale of the whole region.

The Federal Government, as I am informed by M. Ziegler, has recently decided to undertake the publication of facsimiles of the original surveys of Switzerland, which are on a scale of 1 in 50,000 for the highlands, and 1 in 25,000 for the lowlands. These will extend to several hundred sheets of maps, similar to those of our own Ordnance Survey Maps, and will be a lasting monument of the scientific enterprise of this enlightened nation. The Geological Survey of the country, under the directorship of Professor B. Studer, is also in active operation, and its officers are publishing numerous valuable maps.

Italy.—The Italian Geographical Society shows vigorous signs of life, under the guidance of its excellent and indefatigable President, my friend the Commendatore Cristoforo Negri. We trust his genial enthusiasm and unwearied labour will have its reward in the solid and permanent establishment of this Society. Barely two years old, it already numbered, on the 23rd of April, 662 effective members, including 21 Life Members. Two numbers of the Society's Journal have already been issued, presenting an aggregate of some 700 pages, and a third is in a forward state.

Among the papers already issued may be mentioned a valuable one by the Marchese Antinori, on his own travels and those of Signor Piaggia in Central Africa, which was noticed in my opening discourse in November last; an account, by Signor O. Beccari, of his travels in Borneo; a sketch of the voyage of the Italian frigate *Magenta* round the world, by Professor Henry Giglioli, coadjutor of the lamented Senator F. de' Filippi, and successor to the charge of the scientific branch of the Mission, on de' Filippi's death at Hong-Kong, February 9th, 1867; a Journal during the Expedition to Abyssinia, kept by Captain Egidio Osio, of the Italian staff, who was attached to Sir Robert Napier's head-quarters; a paper on the Hydrography of the Nile and Central Africa, by the eminent engineer Elia Lombardini; an interesting letter on old Venetian intercourse with Abyssinia, by Signor Guglielmo Berchet, who has already extracted so much that is valuable from the great stores of the Venetian archives; a grammar of the language of the Denka tribe on the White Nile, by Signor Giovanni Beltrame; and an interesting and appropriate discourse on the Italian travellers of the present century, by Professor Gaetano Branca. It will be for the young Society to take care that in future the achievements of Italian travellers have prompter justice done them both at home and abroad.

The narrative of young Signor Beccari is a concise sketch of what was evidently a series of journeys of great interest, in the interior of Sarawak and the adjoining regions of Borneo. Unfortunately he does not seem to have combined any precise geographical observations with his especial object, the collection of botanical and zoological specimens. With regard to the voyage of the *Magenta*, the general account of the expedition and its scientific results is under preparation for the Italian Government, by Professor Giglioli, assisted by contributions from Captain Arminjon and his officers. The zoological collections brought home by the Mission are in the Museum at Turin, and embrace some 2000 species, chiefly vertebrates and the lower divisions of the invertebrata. Hydrographic surveys were executed in the channels of Western Patagonia; charts of Halt Bay and the English Narrows, from these surveys, have lately been published by the Ministry of Marine. Many ethnological specimens were collected, such as skulls, arms, and implements, besides nine fine Peruvian mummies belonging to a tribe of Aymaras, and found in the vicinity of Cobija in Bolivia. These are believed to be the first of the kind which have reached Europe. Their heads are compressed *upwards*; in this respect contrasting with the Quichua mummies found near Lima, of which also a good series was procured.

AFRICA.—In relation to the interior of Southern Africa and the probable line of research which Livingstone may have followed from the Cazembe country, near the southern end of the Lake Tanganyika, whence he dated his last letter in December, 1867, I have seen cause to modify the views I published regarding his return viâ Zanzibar, and to revert to the opinion I expressed on the 27th April, 1868.*

In a letter from Dr. Kirk at Zanzibar, dated the 5th March, it was very disheartening to learn that by no one of the many traders in ivory who had reached the east coast from the country of Uniamuezi—which the great traveller must have traversed if he had advanced, as we supposed, by the eastern shore of the Lake Tanganyika—had a scrap of intelligence been received respecting him. The theory which I have now formed to account for this entire want of information is that he has quitted the eastern region entirely, and has been following the waters which flow from the western side of the lake. These will lead him necessarily across a large unknown region, to emerge, I trust, at some port on the western coast. In this case, being in a country the inhabitants of which have no intercourse with the Zanzibar territory, we can never more expect to learn any tidings of him from the eastern seaboard. We already know, however, that he had been living with some very hospitable and intelligent Arabs in the interior, and from them he may have learnt that the Lake Tanganyika was really barred up at its northern end, by mountains through which its waters could not flow into the Albert Nyanza of Baker. Or he may, indeed, have satisfied himself by measurement that the altitude of the Tanganyika was of about the same height as that determined by Burton and Speke, and therefore much lower than the Equatorial lakes. In either case, he would abandon the northern search which, at our last anniversary, I believed he might make. Being aware that he was in good health and spirits when he last wrote, and satisfied with his kind reception by the Arab traders, I can see no ground whatever for despondency; and, in the absence of all other information, I suggest that he has been following the waters which are laid down upon the old map of Duarte Lopez prepared in the end of the sixteenth century, and that he will successfully emerge from Africa on the same coast as that where he terminated his first great traverse of South Africa.

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* See 'Proceedings,' April 27, 1868, p. 184.

According to Mr. Major, who called our attention to the above-mentioned remarkable document (which is in the British Museum), this is the very first map on which the interior of Africa was laid down from sources independent of Ptolemy. Although drawn by an unscientific hand, it contains more data which have been shown to be true by recent discoveries than any of the maps which either preceded or followed it. Those which have since been published, up to the period of actual exploration, have been mere speculative combinations from it and from Ptolemy, and consequently inaccurate. Of this map of Duarte Lopez, published in 1591, our Secretary, Mr. Major, has also published a reduction in his admirable 'Life of Prince Henry the Navigator.' This Duarte Lopez, a Portuguese, resided in St. Paul de Loanda from 1578 to 1587, a period at which his countrymen were well established on the Congo, as well as in Sofalá and Mozambique on the east; and during those nine years he was able to gather a large amount of important geographical information from native travellers. On this map are laid down the two great lakes Victoria Nyanza and Albert Nyanza approximately in their right positions on the equator, with another great lake due south of the Albert Nyanza. This southern lake Mr. Major believes to represent a union of the two lakes Tanganyika and Livingstone's Nyassa, probably through the information being derived from the conflicting accounts of travellers coming from different parts of the interior to the west coast. It is unnecessary here to point out those features in the old map which in uniting all the southern waters with those of the Nile basin are probably inaccurate. It is enough to indicate that it is decisive as to the main point, that rivers flow from this lake to the west; and that as regards the now ascertained phenomena respecting the northward course of the watershed of the Nile waters, all the main data are in accordance with modern observation. In our present uncertainty respecting the size of the Albert Nyanza, it is, indeed, interesting to observe that the lake which corresponds to it in Lopez's map is stated in his book to be 200 miles *across* (per traverso). The length is not mentioned. From it are made to flow not only the Nile, which it has received from the southern lake, but the Zaire or Congo. So early as 1519, Enciso, in his 'Suma de Geografia,' had spoken of a great lake, from which flowed both the Manicongo and the Nile; and Barros, in speaking of this same lake from which these two great rivers flowed, gives astounding accounts of its size, the great ships which sailed on it, and of a civilised people around it who lived in stone houses equal to those of the Portuguese, and so forth. But, due allowance being made for exaggeration, we see in it the indication of a central lake of immense extent.

On this map of Lopez was also laid down for the first time the great empire of Monomoezi or Uniamuezi, occupying its right position between the Victoria Nyanza and Lake Tanganyika.

But I will not now dwell on the various claims to credibility which this remarkable map presents, as they have been already well set forth by Mr. Major. My object is to call attention to the curious information it affords respecting those regions about which we hope to receive due enlightenment on the return of Livingstone, and which will, as far as the Nile basin extends, be thoroughly laid open by Sir Samuel Baker, should he—through the patronage and munificent support of the Viceroy of Egypt—be enabled to carry out his grand project of navigating the Albert Nyanza in a steamer, of bringing into order the uncivilised and ever-warring native chiefs east and west of the White Nile, and of entirely suppressing the slave-trade in that region.

When we reflect upon the statement of Lopez which accompanied his old map, that the lake—which he lays down as occupying the same equatorial position as the Albert Nyanza—had a width (*i.e.* from east to west) of 200 miles, I am led to suggest, that the detached large sheet of water heard of by the brothers Poncet, and already inserted in a map by Petermann, may prove after all to be simply the western end of the Albert Nyanza, and a part of that great internal water-system which gives birth to the Nile.

South African Gold-Fields.—Whilst I adhere to the opinion I expressed last year, that the Ophir of Solomon was probably in that part of South Africa which lies between the southern affluents of the Zambesi River and the northern feeders of the Limpopo, in which some gold has recently been discovered, I did not and do not hold out any incitement to speculators to look to that region as one which will prove rich in produce. Many countries, like Bohemia and Spain in Europe, which formerly yielded notable quantities of gold, are now barren of it; the ore having been largely extracted in past centuries. To what extent the gold collected in the days of Solomon, or in ages long after by the Portuguese settlers, did exhaust these alluvial auriferous deposits of South-Eastern Africa, in which gold might be easily worked, is unknown; but it is certain that the information recently derived from the Government of Natal, and obligingly communicated to this Society by the Secretary for the Colonies, affords but slender hopes of the realization of profitable diggings in the vicinity of that colony. At the same time it is to be recollected that as yet none of the parent gold-bearing rocks from which such deposits have been derived have been penetrated; but even if so commenced, we can scarcely expect that such works can as yet be profitably carried out in the wild, distant, and uncivilised regions where such parent rocks occur.

ASIA.—*Central Asia.*—The subject of Central Asia has still more than in preceding years occupied our attention. For, whilst the Russians have made very extensive surveys in the Thian Shan Mountains and far beyond their conquests along the course of the Jaxartes or Syr Daria and in the Khannat of Bokhara, our Medallist, Capt. Montgomerie, has, through the agency of his well-instructed native Pundits, completed a geographical survey of the south-western mountainous regions of Thibet, which was entirely unknown to our predecessors, and in which extensive gold-fields occur.

Thanks to the measures taken by our energetic Associate, Mr. Forsyth, to propitiate the present ruler or Kooshbegie of Eastern Turkistan, Mr. Shaw, a British tea-planter from Kangra, has been enabled to traverse all the lofty mountain passes north of Leh, and has carried his caravan of merchandise into the Yarkand territory. As this is the first time in which such a success has been achieved, and as all that fertile region has been entirely abandoned by the Chinese, we may reasonably infer that our tea-plantations of Hindostan may in future supply the Mahommedan inhabitants of the vast region formerly known as Chinese Tartary with the indispensable article of tea, which they have scarcely tasted since they threw off the Chinese yoke.

If the extensive chain of the Thian Shan, which the geographer Semenof has in great part delineated, should be fixed upon as the eastern boundary of the Russian empire in Central Asia, our allies may on their part carry on from their frontier a profitable trade with the Kooshbegie, or chief, of this fertile region of Eastern Turkistan, whilst the British may send thither the Indian tea, *viâ* Cashmere, in exchange for the many valuable products of that region.

The subject of trade routes between Turkistan and India has indeed occupied the attention of the Society on two evenings during the present session, and it is a source of pleasure to all geographers to find how surely, though slowly, we are becoming acquainted with the regions beyond the northern frontier of India, across which European travellers in the middle ages frequently passed on their way to China. With regard to the itinerary of Mahomed Amin, a Yarkand merchant, communicated to us by Mr. Hayward, I am informed by Colonel Henry Yule that this was the same person who was guide to the unfortunate Adolphus Schlagintweit. According to Colonel Yule, to whom I am indebted for nearly all the information in the following part of my Address, the routes had indeed been already in print, among the Appendices to that interesting 'Report on the Trade and Resources of the Countries on the North-West Boundary of British India,' by Mr. B. H. Davies, of the Indian Civil Service, which was printed at Lahore seven years ago (1862). This Report was printed in 1864 by order of the House of Commons, on the motion of Mr. Henry Seymour, but from the reprint were excluded the whole of the valuable original data constituting the Appendices, as well as the whole of the maps! For this saving, which was not an economy, I do not know which department we have to thank; but, from this cause, the routes contained in the original Lahore Report have been scarcely accessible in this country, and it may be worthy of consideration whether we should not do well to reprint others which are to be found in its Appendices, as well as that of which Mr. Hayward sent us a copy.

The maps accompanying the Lahore Report contained a praiseworthy endeavour by Captain Lumsden, of the Quartermaster-General's Department in India, to embody the information contained in these routes; and Colonel Walker, Superintendent of the Trigonometrical Survey, has also very recently made large use of that information in his 'Map of Turkistan, on four sheets, based on the Surveys made by the Russian and British Officers up to 1867, and on the most recent Itineraries.' This work of Colonel Walker's does not enter into great topographical detail, but it is invaluable as a combined view of the sound results obtained up to the latest date, and marks a step in our chartography of that region such as has not been made for nearly thirty years. In fact, between the deviations introduced by the Schlagintweits and the misleading guidance of the anonymous MS. of the Russian archives, discussed at our meetings by Sir Henry Rawlinson and the late Lord Strangford, the maps of Central Asia published by some eminent foreign geographers of late years had in some important points rather retrograded than advanced in accuracy.

One result of the new information which Col. Walker has co-ordinated in his map has been greatly to enlarge the width of the little-known mountain country between the Upper Oxus Valley and the basin of Eastern Turkistan, and to throw new light upon the territories occupying this interval, which, according to Colonel Walker's map, expands to 386 miles. "Hence it is now much easier," says Colonel Yule, "to account for the great number of days assigned by Marco Polo, Benedict Goës, and all the Oriental itineraries, to the passage between Eastern and Western Turkistan."

"Between Yarkand and the plateau of Pamir, again," as Colonel Yule reminds me, "our maps had nothing to show implying human occupancy beyond one or two names resting on questionable authority, and representing one knew not what, of which *Karchu** was the most prominent. Nor had we any knowledge of settled towns and villages in those mountain recesses. Yet the old Chinese pilgrims to India, whose route often lay this way, speak of principalities which must have lain in this region. Such, in particular, is the kingdom of *Khiepuanto* (*Khavandha*), visited by Hoeï-seng in 518, and by the more celebrated Hiuen-thsang in the following century, when descending from Pamir.† The country, according to his description, produced little rice, and few fruits and flowers, but abundance of wheat and pulse. The population was small, and the people somewhat rude and violent. But they must have attained some degree of civilisation, for they possessed a written character and some ten Buddhist convents. Their Prince styled himself *China-Deva-gotra*, 'Son of China and of the God'—a title accounted for by a romantic tale like that of the paternity of Romulus."

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* The *Karchu* of our maps appears to represent *Kara Su*, "Black water," the name of one of the rivers running down from Pamir.

† *Ritter*, vii. 498, 563; *Hiouen Thsang, Mém. sur les Contrées Occidentales*, by *Julien*, ii. 209 *seq.*

"This kingdom, which was reckoned very ancient in the seventh century, was doubtless identical with the modern province of Tashkurghan, formerly called Sarikul, which appears in Mahomed Amin's Routes, and is described by Pundit Munphul in one of the valuable Appendices to the Lahore Report.* That a district bearing the name of Sarikul existed on the eastern face of Pamir was known indeed, for it is mentioned by Moorcroft, and appears in the Tables of the Jesuit Missionaries, but any distinct knowledge regarding it appears first, I believe, in the Lahore documents.

"These inform us that Tash Kurghan (which is properly the name of the chief place of the province) contains several fertile valleys, flanked by high mountains, whose peaks bear up perpetual snow, or by lower ridges subject to snow-falls only in the depth of winter, and affording fine pasture to large herds of shawl-goats, sheep, yaks, cows, camels, and horses. The province is stated by the Pundit to extend 250 miles from the Karakorum Range, on the south, to the Kizil-art Range, on the north, and 100 miles from the Pamir Range, on the west, to Chiraghtang, on the banks of the Yarkand River, on the east. These dimensions require modification; for, according to Colonel Walker's draught of the province, from the slender data yet attainable, the greatest extent from north to south will be about 112 miles, and that from west to east about 140. The capital, Tashkurghan, is stated to be a very ancient city, round in form, more than a mile and a half in circumference, and with walls built of unusually large blocks of hewn stone, situated in a plain. Its crops consist of wheat, *Bájra* (one of the tall Indian millets, *Holcus spicatus*), and peas; its fruits, a few apples and apricots.

"The name of *Tashkurghan*, meaning the 'Stone Fort,' is apt to suggest the possibility of its being Ptolemy's famous *Turris Lapidea*, which was so notable a point in the mercantile route to ancient China. It is difficult, however, to reconcile the geographer's indications with a position so far to the south, and the name is too common a one in Turkistan to be of value in identification.

"I may here refer to the report which Mr. Johnson brought back from Khotan of the existence of an open road from Ilchi, round the eastern extremity of the Kuenluen Mountains, by which wheeled carriages could pass from the Himalayas direct into the plains of Central Asia. Now, there is a very curious passage in Moorcroft's 'Posthumous Papers' which records the same report as to a cart-road, and gives even greater extension to it. I quote from the first volume of our 'Journal' (p. 243):—'The trade between Hindostan and Khotan was formerly very extensive; and it is even said, though, I presume, rather figuratively, that a loaded cart could go all the way from Nugeebad (*Nujibabád*, near Hardwár?) to Sureekeea, in the mountains of Khotan.' And, in a note, Moorcroft adds that this road was reported to have passed by Rudokh and Gartokh. The details of Moorcroft's information on this matter were probably incorrect, for it does not seem consistent with ascertained facts, as exhibited in Colonel Walker's map, that there should be a road passable for carts from Rudokh, on the Plains of Chanthang, to Surikia* (which is the valley of the Karakash River, below Suget), and the direction indicated by Johnson, *viá* Polu and Kiria, is quite different.

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* *Report,* &c., Append. p. cccxxvi. *seq.*

"Moorcroft's note proceeds to mention a remarkable relic of a regularly made and *paved* road, which he came upon in Gurwál, in 1812, on the Indian side of the Himalaya, and which was attributed by an old peasant to an unknown Badshah or Emperor. He had heard, he said, that in ancient times much commerce was carried on by it between Hindustan and some very distant countries. Moorcroft suggests the possibility that this might be a relic of a former imperial road to Khotan. His indication of the site is that it lies 'a few *kos*, as far as memory serves, to the north-east of the village of Bundalee, which lies (he conceives) to the north-west of the ruined fort of Chandpoor,' and not very far, apparently, from the Pindar River. It would be worth while to call the attention of Colonel Walker to this notice of Moorcroft's."

Burmah and China.—The Bhamó Expedition.—The expedition despatched last year by Colonel Fytche, the Chief Commissioner of British Burmah, to communicate with the new Mahomedan rulers of Yunan, and to endeavour to re-open the trade between that province and the Irawadi River, by way of Bhamó, met with many difficulties and delays. Captain Sladen and his party eventually reached Momein, the frontier city of the Mahomedan Government, and were received with great cordiality by the Governor. But he so strongly discouraged their advance to Talifu, on account of the still disturbed state of the country, that Captain Sladen felt apparently that he could not, consistently with the strict injunctions of his own Government, risk the complications that might result from an advance in opposition to the Governor's advice. Nevertheless, as Captain Sladen resided seven weeks at Momein, we may look for much valuable information when his Report is received. One somewhat surprising fact we learn, viz., that Momein is estimated to stand at some 8000 feet above the sea-level. The only Report of the expedition which has yet reached us is one printed at Rangoon, by Lieutenant Bowers, apparently a retired officer of the navy, who accompanied the expedition as representative of part of the commercial community of British Burmah. It is not a document of much lucidity or intelligence, and does not at all diminish our desire to see Captain Sladen's own Report.*

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* This, however, is not quite certain, looking to Mr. Johnson's observations in the 'Journal of the Royal Geographical Society,' vol. xxxvii. page 2, line 6.

Expedition of Mr. T. T. Cooper.—A persevering and intrepid explorer, Mr. T. T. Cooper, made an attempt, early in the year 1868, to traverse the unknown region between the Chinese province Sze-chuen and Assam, but was turned back by the Chinese authorities at Bathang, after making a successful journey up the Yangtsze and Tai-tow-ho rivers, and through the frontier town of Tai-tsian-loo. In August, 1867, he communicated his plans to the Council, in a letter written at Shanghai before starting, and a letter of instructions was drawn up by a Committee called for the purpose; but unfortunately these instructions, together with a letter I wrote myself, did not reach China before he started on his journey. They have since been returned through the Post-office; and Mr. Cooper, to the present time, is probably unaware of the interest we have taken in his movements. We learn that after his compulsory return from Bathang, he endeavoured to cross to Burmah *viâ* Yunan, and, finding this also impracticable, has gone round to Calcutta with the resolute purpose of exploring the routes between India and Western China from the side of Assam. A letter from Calcutta states that it is Mr. Cooper's intention to proceed slowly and to make a long sojourn, if needful, among the interior tribes; ingratiating himself with the chiefs and people, remaining months with one tribe, and then moving forward a stage to the territory of the next. Once at Bathang, he says, there will be no further difficulty. Although not a scientific man, Mr. Cooper seems to have many of the necessary qualifications for a traveller in difficult regions like that he is now attempting to penetrate. The Calcutta merchants have raised a subscription to pay his expenses.

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* On this subject of communication with the South-Western, and now independent, Chinese Province of Yunan with Burmah, *viâ* Momein, I received some valuable information from Colonel Ripley, who has been for many years Political Resident in Burmah. I regret to say that the notes with which he furnished me, in the form of a commentary on the Mission of Dr. Williams, have been mislaid.

French Exploration of the Great Cambodia River, and of Yunan.—It is but recently that distinct information regarding this remarkable journey has come before me,* and I gladly take the opportunity of doing some justice to one of the most remarkable and successful exploring expeditions of the nineteenth century. The one great cause of regret connected with this enterprise is that its indefatigable leader, Captain de la Grée, did not survive to carry to Europe the results of his labours and hardships.

The expedition was constituted, in 1866, under the order of the Imperial Minister of Marine, M. Chasseloup de Laubat. It was placed under the command of Captain Doudard de la Grée, of the Navy, with Lieut. Francis Garnier, of the same service, as second in command, Messrs. Joubert and Thorel as surgeons and observers in natural science, and two junior officers. They left Saigon 5th June, 1866.

The highest point previously fixed by the French on the Great Cambodia River was Cratieh, about 280 miles from the mouth, and standing in 12° 28′ of N. latitude, where the tide is still slightly felt. Beyond this a long succession of rapids was encountered, occurring in a scarcely inhabited region of splendid forest which separates Laos from Cambodia; and 125 miles above Cratieh actual cataracts, some 50 feet in height, were met with. These will be an absolute interruption to the continuous prosecution of steam navigation, even so far indeed difficult to maintain.

It is worthy of notice that these rapids and cataracts are specially mentioned in the old Dutch narrative of Gerard van Wusthof, the leader of the last expedition (so far as we know precisely) that ascended this river—a journey that took place more than two centuries ago (1641).

Above the cataracts the river narrows and deepens between mountains; the width being reduced at some points so low as 300 feet, whilst the depth attains as high a dimension.

Between Khemarat and Vienchang (the ancient capital of Laos, which was visited by the Dutch Envoys, and is called by them *Winkjan*) the Great River again flows through a plain country, but at the last point mountains are again entered, and in all probability continue to its remote source. At Luang Prabang the travellers met with pleasing memories, and visited the grave of our lamented correspondent Henri Mouhot; but the latitude assigned by him to places on the route thither prove to have been more than 1° in excess.

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* Contained in the 'Bulletin de la Société de Géographie,' 1869, p. 97 *et seq.*; and in the 'Revue Maritime et Coloniale,' Avril, 1869.

It proved impossible to prosecute the journey up the course of the Cambodia River beyond Xieng Hong, or Kiang Hung, as we are more used to call it; the terminus of Lieut. Macleod's remarkable journey in 1837. It is satisfactory to find that the latitude of Kiang Hung observed by the French party is in perfect agreement with Macleod's, allowance being made for a transfer of the exact situation of the town since his journey.

From Kiang Hung the travellers struck northward through Southern Yunan, passing the much-talked-of Esmok, now deserted, and made their way through that *terra incognita* to the city of Yunanfu, where they arrived 24th December, 1867, eighteen months and a half after leaving Saigon.

The Society is aware that, for some fourteen or fifteen years past, the Mahomedans, who have formed an important part of the population of Western Yunan since an early date in the middle ages, have been in revolt against China, and have succeeded in establishing an independent state, under a certain Sultan Suleiman, with their capital at the old city of Talifu, itself a chief point in the great commercial route between Burmah and China. It was to the French party an object of high interest to reach Tali, both on account of its geographical position and its present political importance. But when they were at Yunan the two parties were in open war, and direct passage from Yunan city to Tali was out of the question. Their resolution, however, was not easily baffled. Leaving his chief, whose rapidly failing health incapacitated him for further exertion, under charge of one of the medical officers at Tongchuan, in northern Yunan, Lieutenant Garnier turned the scene of active hostilities by a venturous détour across the gorges of the Kinsha, or Upper Yangtsze, and actually succeeded in penetrating to the Mahomedan capital. Though appearances at first were flattering, the party had to leave next day in circumstances of great peril, and their leader had the satisfaction of bringing them all back in safety to Tong-chuan, where, however, they had the grief to find their gallant leader in his grave. This episode in the journey could not have been achieved without remarkable courage and address on the part of Lieutenant Garnier.

Carrying the leader's body with them, the party at length reached Sucheufu, on the navigable Yangtsze; here their perils and fatigues were at an end, and they were able to embark on the river for Shanghai, which they reached on the 12th June, 1868.

No Asiatic journey for many years, that I know of, has traversed so great an amount of absolutely new country. We need not take much account of the scanty old Dutch narrative, already alluded to, nor of the missionaries of the Roman Church, who have long been familiar with remote corners of the Chinese empire, but whose familiarity has brought little to bear in augmenting the public store of geographical knowledge. The whole journey of the French explorers from the tides of the Mekong to Suchcu, on the Yangtsze, with the solitary exception of Kiang Hung, where they touched the terminus of Macleod's journey, may be regarded as on virgin soil. 6200 miles were travelled by the party between Cratieh and Shanghai, of which 2480 were accomplished on foot! Route-surveys have been made of 4176 miles of the journey, corrected by the determination of 58 points by astronomical observation. Much other knowledge has been accumulated in philology, antiquities, zoology, botany, and geology, and several hundred sketches have been brought away. The narrative of the journey and its results is under preparation by Lieutenant Garnier, and will be published by the Imperial Government on an important scale. This most remarkable exploration will, I trust, be rewarded at our next Anniversary by the award of a Gold Medal.

SOUTH AMERICA.—Our indefatigable Gold Medallist, Mr. Chandless, having been unsuccessful in his attempt to ascend the Beni, has turned his attention to other affluents of the Amazon, and has completed the examination of the River Juruá, which, rising in the dense forests on the left bank of the Ucayali, falls into the Amazon between the mouths of the Ucayali and Madeira. Mr. Chandless has done his work with his usual scientific accuracy, and has fixed upwards of sixty positions along the banks of the Juruá.

The Peruvian Government has lately been displaying much energy in the exploration of the magnificent fluvial highways which traverse the eastern half of the republic. A sort of dock has been formed at Yquitos on the Amazon, and a steamer has recently ascended the Ucayali and Santa Ana to within a short distance of the ancient city of Cuzco. Our Associate, Señor Raimondi, is pursuing his researches with unabated energy, and we have received another valuable communication from him since the date of my last

Address, on some of the tributaries of the Ucayali. Señor J. G. Nystrom has also been employed in Peru, during the spring of 186[illegible], in exploring the unknown forest-covered region to the eastward of the Andes. He has penetrated into the *montaña* of Paucartambo, and it appears from his very able Report that he fixed several positions by means of meridian altitudes and lunar distances, and also took a series of carefully registered meteorological observations. This is the country that was explored by Mr. Markham in 1853, and it is satisfactory to find that the topographical details in the maps prepared by Mr. Markham and those of Señor Nystrom fairly agree. I am gratified to place on record that, when Mr. Markham made his observations in 1853, by meridian altitudes, and with sextant and artificial horizon, he was only twenty-two years old, and was quite single-handed, being accompanied by two Indians only. It is, indeed, creditable to him that, in a vast unknown forest-region, he should have been able to register so much topographical knowledge, and even to insert many more names in his little map than are to be found in that of Nystrom, who was accompanied by a strong body of soldiers and two educated South Americans. We have also received a new edition of the Atlas of the Republic of Peru by that enlightened philanthropist Don Mariano Felipe Paz Soldan, whose introduction of an improved system of constructing gaols and of prison discipline has conferred a great blessing on his native land. His new atlas contains 44 maps, 28 plates, and 78 printed pages.

From Bolivia, as I am informed by Mr. Markham, we have notice of a voyage of so peculiarly adventurous and enterprising a character that I cannot pass it without notice. Last year a Bolivian gentleman named Rada conceived the idea of collecting chinchona bark on the slopes of the Andes, and, instead of consigning it to some agents in a port of the Pacific, of taking it himself to England by descending the rivers Mamoré and Madeira. This was in itself almost a voyage of discovery. He embarked his valuable cargo in canoes, and, accompanied by his young wife, descended to the mouth of the Amazon, arrived safely at Liverpool, and, I am glad to be able to add, realised a handsome profit. The River Amazon has been remarkable for the adventures of fair ladies. The fate of Inez de Atienza is one of the wildest and most thrilling tales in the history of Spanish conquest in America. Madame Godin's voyage alone in quest of her husband, who was one of the members of Condamine's French expedition, is equally romantic. And now we have a third Amazonian heroine, in the person of this brave young Bolivian lady.

From Brazil we have received several valuable and well-executed maps, amongst which I may specially mention an Atlas of the Empire by Dr. Candido Mendes de Almeida, who has, in consideration of this important geographical work, been elected a Honorary Corresponding Member of our Society. Our Medallist, Captain Burton, who, since his residence as Her Majesty's Consul at Santos, has lost none of the zeal for geographical science which he displayed so signally in former years in Africa, has also given to the public the detailed and curious results of his Brazilian explorations since the date of my last Address.

At Buenos Ayres, Don Saturnino Salas, the Head of the Topographical Department in the Argentine Republic, continues his valuable labours, and we have this year received from him an excellent plan of the city of Buenos Ayres on four sheets.

THE FORMER AND PRESENT PHYSICAL CHANGES OF THE SURFACE OF THE EARTH COMPARED.—Towards the conclusion of my last Address, I called attention briefly to the dependence of geography on geology, or what was then termed the "oldest comparative geography." It was then shown that many of those ancient features were absolutely dependent on subterranean movements, which from the earliest periods had been chiefly concerned in bringing about the broad outlines of the earth. I then endeavoured to carry the mind's eye back to ages long anterior to the creation of man, and pointed to the various changes which the surface had undergone before the earlier rude contours of land and water were established, to be brought, at subsequent periods, into their present forms by denudation, both sub-aqueous and sub-aërial, as well as by the wear and tear of centuries. I further showed that, during the incalculably long eras when the various sedimentary strata constituting the largest portion of the crust of the globe were accumulating, abrupt changes of form took place at intervals, whether due to shrinkage or contraction of the outer crust, or to the expansion of internal heat and gases, which produced great breaks and foldings in the various outer layers of the earth. These phenomena, I argued, were sufficiently attested by the enormous dislocations of its crust, which have taken place in many parts of the globe. As I then inferred that there are regions where some of the prominent features, as determined in primeval days, are still maintained (though doubtless since much modified by the diurnal atmospheric action), so I now wish to proceed somewhat further in explaining how, in my opinion, some of the most recent of these grand geological phenomena, which severed into separate fragments great masses of land, and have, in fact, made our country into its present insular condition, were among the greatest of all these changes.

No one fact has been better established by geological research than that after the close of all the great submarine accumulations of Primary, Secondary, and Tertiary age (with intercalated masses of fluviatile and terrestrial origin), the various formations, which had been elevated at some periods into dry lands, and depressed at others under the waters, at length were raised into great continental masses, which were eventually tenanted by races of numerous terrestrial quadrupeds and other animals, congeneric but not identical with those now existing. The period when a variety of such animals as the elephantine mammoth, the lion, the bison, the bear, the hyæna, and herds of extinct oxen ranged over northern Europe, before England was separated from the continent, is attested by the abundant relics of such animals, which could only have migrated from a common centre when our islands were united as parts of the *terra firma* of France and the adjacent countries, where such fossil *reliquiæ* are found. Knowing, then, that the separation of England from France, as well as that of Ireland from Great Britain, was effected after the migration of these ancient quadrupeds, I am confirmed in the belief by the evidences which geological inquiry has recently yielded, that some of the most powerful explosions of volcanic force of which we have evidence also took place in the very latest tertiary periods. For example, the discoveries of the Duke of Argyll, Mr. Geikie, and others, which have shown that the outpouring of the enormous basaltic and other volcanic rocks of the Hebrides and the north of Ireland took place after the Miocene tertiary period, and buried under their *coulées* the plants of that epoch, affords the strongest indication of the sudden nature of the forces. These eruptions may well have been accompanied and followed by those disruptions which, separating England from France, formed the Straits of Dover, and let in the Irish Sea, in place of lands which formerly connected Ireland with England. Of this latter opening and depression, indeed, during pre-historic times, we have the most pregnant proofs in the fact that the Isle of Man, lying midway between the two countries, contains remains of the same gigantic elk, the *Cervus megaceros*, which so abounds at the bottom of many bogs of Ireland. For, as remains of this huge animal have also been found in Cheshire, the only reasonable inference we can draw is that the formation of the Irish Channel was caused by a great destruction and denudation of the *terra firma* which once united the two countries, when the great elk was the inhabitant of both. For on no reasonable hypothesis can it be even suggested that an original and separate creation of this huge elk took place in the little Isle of Man; still less can the idea be tolerated that a herd of these unwieldy animals swam over a broad sea to the Isle of Man, if it be supposed that this spot had then been an island.

Again, the separation of England from France by a great geological break between those two countries after they had been one *terra firma*, is quite in accordance with the character of the abrupt cliffs on either side of the Channel, as well as with their composition and fossil contents. So in the Irish Channel we see that the headlands of Bray, near Dublin, and those of North Wales must once have formed a continuous whole.

Certain writers of eminence, indeed, who strive hard to account for all the diversities in the outlines of the earth by causes of no greater intensity than those which prevail at the present day, maintain that, if time enough only be granted, the seas and rivers, now actually flowing, combined with atmospheric influences, may have done all the necessary work of abrasion, to account for such breaks and cavities.

These authors opine that the long-continued action of water, as we now see it act, whether by seas or rivers, would account for the sweeping away of all débris from rocks which are now bare and smooth. They also explain the formation of vast subterranean caverns by the long-continued erosion of the limestone or other rocks by rivulets which once flowed in them.

I will offer some other reasons for dissenting from this view. First, let us revert to the broken and abrupt cliffs which face each other on the opposite sides of great marine channels, or those in the hard mountain limestone which forms the gorge of the Avon at Clifton, near Bristol, and countless other river-gorges; how shall we explain these precipices by gradual wearing away? If the operation had been gradual, instead of the coast cliffs presenting proofs of dislocation and fracture, as they do, we ought, on the contrary, to find sloping dunes in their places!

Again, the western sides of the Welsh mountains tell the tale of prodigious elevations, by which sea-shells of modern Arctic species have been heaved up to heights of 1600 feet above the sea. In that tract (Mont Tryfane) we have the correlation established of a great upheaval of the sea-bottom into high lands, in juxtaposition to an adjacent deep sea, each dependent upon a fracture and great oscillation of the crust, followed of necessity, as I say, by intense denudation, through the power of huge waves.

My hearers who may be inclined to believe that, if a sufficient lapse of time be granted, much of the result may be explained by the gradual erosion of ages, will be pleased to recollect that the enormous depressions and denudations I am alluding to have been formed, as I have shown, since the great quadrupeds, now extinct, travelled over all these lands, and before they were broken up and disunited, and therefore these great solutions of continuity occurred in what may be considered one of the last units in geological time. This reflection, coupled with manifold proofs of rupture, as contrasted with long erosion, seem to me to lead irresistibly to the conclusion that, not long before, and possibly even after the creation of the human species, there took place some of those greatest disruptions of the crust of the globe of which its surface presents innumerable physical records.

I must here take the opportunity afforded me, perchance for the last time, of saying to geographers a few words on the subject of denudation; which is, indeed, a subject well worthy of their consideration.

Some geologists have, indeed, of late years appealed to ordinary diurnal erosion in a most liberal manner to account for many of the leading features of the surface of lands, whether in the excavation of valleys or the sweeping away of all detritus from plains and hills. But if we merely interrogate existing nature, and mark the enormous difference between an occasional modern catastrophe and the ordinary action of the ocean or the atmosphere, we must, I think, admit that the clean sweeping denudation by the grand waves which must necessarily have followed every great terrestrial movement in geological times, is fair and reasonable geological reasoning. Agreeing, as I do, with the main doctrine of the Huttonian theory, so admirably illustrated by Lyell, that denudation is essentially the removal of solid matter by water in motion, and that it has performed enormous works, I deem it to be essential to the right estimate of such power not to restrict the erosions which took place, in past geological times, to the ordinary action of the waves and currents of the sea and rivers. For, granting that the results of the present riverine and atmospheric action, as measured by the detritus carried down by great rivers to the sea, must, in certain countries where the rocks are soft or incoherent, eventually carry away such lands, as in the region watered by the Mississippi, no such forces, if continued for countless ages, will account for the complete denudation and clean sweeping which has taken place in innumerable plateaus, deep valleys and gorges of hard rocks. Still less will any ordinary currents of the sea transport blocks of rocks from one tract to another. Yet this, as geological evidence teaches us, has often occurred in periods when, and in localities where, no ice-bearing agency can have acted. In short, it is a well-ascertained fact that deep sea-currents exert no transporting agency whatever, and that the smallest fragments only of sand, mud, and shells, remain at the bottom of such deep seas, and lie in an unruffled state. It is the action of wave-breakers alone that abrades coast cliffs, and if such lands had not presented cliffs to the waves, no serious wearing away of them would occur. Hence it follows, that in order that the ocean should have power essentially to reduce continents or islands, these masses must have been first broken up though internal forces in such a fashion as to present precipitous escarpments on which waves could act.

Admitting, then, that dislocations produced such cliffs in former geological periods, we have, it appears to me, a "vera causa" which sustains the inference that such movements were accompanied by intensely powerful aqueous denudations. Let us then compare such convulsive changes as have been brought about in historic times (and recently, indeed, in startling activity) with those which must have been produced by the much larger bodies of water which were set in motion when great upheavals of sea-bottoms and lands took place in geological times. Look to that which is or has been effected by ordinary currents of the ocean or waves in our day, and compare the results with the effects produced by a *single wave of translation* when set in motion by an earthquake. Thus, we know that the recent small movements of the crust of the earth, of only a few feet upwards, which occurred on the coast of Peru, heaved back the sea for a few minutes! and then look at the stupendous effects produced by that one returning wave resulting from so slight an oscillation of land, when backed by the whole pressure of an ocean. Did it not instantly destroy a fine city, and, scouring the shore, transport a ship and hurl blocks of stone far inland?

To us dwellers on the earth this was truly a catastrophe. But, let my brother geographers go back with me into former, and not very distant, geological times, when the proofs of the sudden upheaval of coasts and sea-bottoms are to be seen in the effects of those great vertical heaves which threw up masses of sea-pebbles and shells into clean-cut and separate terraces at different heights. For, each of these terraces — as seen around many parts of our islands, on the coasts of Europe and America, and particularly on the flanks of the great lakes of America and Asia—affords to my mind the clearest evidence of great upheavals.

As these terraces of sands, gravel, and shells, separated often from each other by hundreds of feet, are convincing proofs of sudden upheavals of vast magnitude, so it follows that the bodies of water which were propelled on each of these occasions must have produced denudation and dislocation a thousandfold more grand than those of which the wave of South America or of any existing volcanic and earthquake region has afforded evidence in our days.

In short, it is quite conceivable that the renewal of any one of the great upheavals of former periods would not only sweep away most of the inhabitants of our continents, but would deepen our valleys by laying bare the rocks, which are now covered with various loose deposits, and all this without involving that long lapse of time which, with some modern writers, is the sole specific employed to account for and explain away all former changes of the surface of the globe.

No geologist, past or present, is more ready than myself to avow that the growth and increment of the former great accumulations of detrital matter call for and demand incalculably long periods, during which the successive races of animals and plants came into being, perished, and were followed by other races. But, though never parsimonious of time to account for the stupendously long history of succession, I am equally convinced, from the nature of the contortions, fractures, and dislocations of the crust of the earth, that these must have been accompanied by diluvial and transporting waves of incomparably greater power of translation, and consequently of denudation, than any force which man has ever witnessed.

I dwell with emphasis on these phenomena of former physical changes, as compared with those with which modern geographers are acquainted, because from this comparison we may reasonably infer that, if an earthquake and oscillation of the land of our period can produce such wondrous effects by one wave as on the Peruvian coast during the last year, the effect of the infinitely grander waves of translation, which must often have been put into play during the former gigantic oscillations of the crust, must well have cleared the hills and valleys of all those broken materials which were left there by the sudden upheavals of former times;* whilst no ordinary diurnal atmospheric action, and no currents of the sea as they now act, could have produced such remarkable results.

CONCLUSION.—This Address has reached much larger dimensions than I intended, and has, I fear, fatigued many of you who have honoured me by sitting through this meeting. My apology is, however, that I have endeavoured to show you that my duties have been performed, by laying before you as clear a view as I can of the progress of geographical research in various countries, whilst I trust that in all previous sessions I have kept you well together in the bonds of continuous good feeling.

The ballot having terminated before I conclude this Address, I find that I am once more placed at your head for the usual official period of two years, and I have, therefore, to thank you heartily for this proof of your confidence in your old President. But the duration of my health and life during such a term is not to be relied upon, and if at the end of the first of these two years I should find that I am incapacitated to serve you with the same zeal as heretofore, you will, I am sure, permit me to retire with your thanks for my devotion to your cause. In truth, I had resolved to cease to hold office at this anniversary; but when the Council unanimously urged me to remain at my post, and declared that I must be found in this Chair at a time when it may be expected that my dear friend Livingstone will return to this country, acquiescence on my part became a sacred duty: and so, gentlemen, I hope to live to see the ardent hopes of the British public realised, and to be able on my own part to preside for a second time over a grand national Livingstone banquet.

Lastly, Gentlemen, it affords me the highest gratification to inform you that our Vice-Patron the Prince of Wales signified to me, whilst these sheets were passing through the press, that he would attend the Anniversary Dinner of this day. The words in the letter addressed to me evince such a true geographical spirit that I transcribe them as a most encouraging and satisfactory conclusion to this Address.

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* For a much more expanded view of this subject, see the last chapter of the 4th edition of 'Siluria,' p. 489 *et seq.* Also Hopkins on the 'Elevation and Denudation of the Weald of Sussex,' and Whewell on the 'Powers of Waves of Translation,' as given in the 1st edition of the 'Silurian System,' p. 538.

"I can assure you (writes His Royal Highness) that nothing will interest me more, or give me greater pleasure, than attending this Dinner at which you preside. My only regret will be, that our mutual friend, Sir Samuel Baker, will not be present. I have taken great interest in the grand project of the exploration of Equatorial Africa, which is to be effected under his guidance, and I heartily wish him all success."

This language of the Heir Apparent may well be recorded in our Volumes, as our eminent Medallist, Sir Samuel Baker, himself has told me that it was mainly through the active personal exertions of the Prince of Wales that the Viceroy of Egypt was led to carry out in a munificent manner this great and laudable undertaking.

POSTSCRIPT.—*Discovery of the true Mouth of the Limpopo or Bembe River.*—I am able to add, as my Address is being finally printed off, that the great desideratum in South African geography, to which I adverted in a former Address, has been at length accomplished through the meritorious exertions of Mr. St. Vincent Erskine, a son of the Colonial Secretary of Natal, the Hon. D. Erskine. The great distances traversed on foot by this adventurous and undaunted young explorer, the resolution with which he overcame the most serious difficulties and dangers, the numerous astronomical and physical observations which he made, and the excellent map he has constructed, of the vast region extending from the north of Natal to the Limpopo, combine to render this communication one of the deepest interest. The subject will be brought before the Royal Geographical Society on the 14th June.

1st *June*, 1869.

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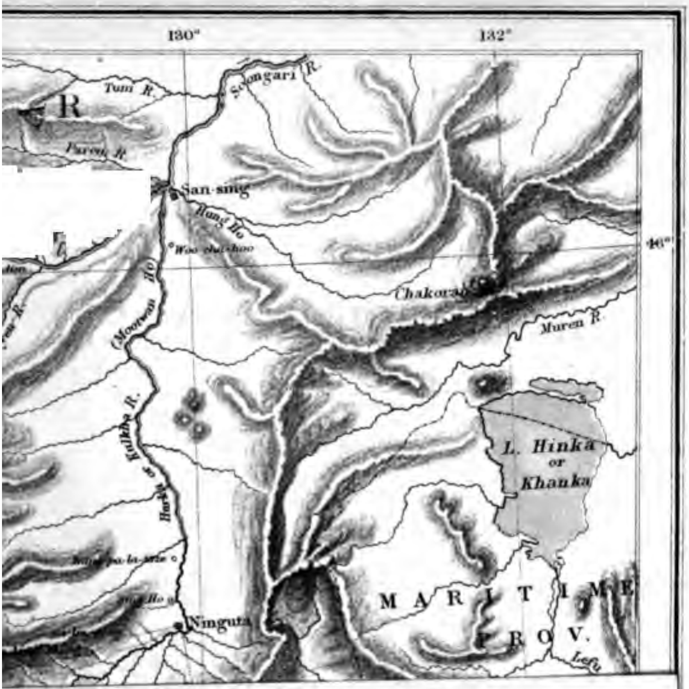
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PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY

DURING THE SESSION 1868–69.

[FORMING VOL. XXXIX. OF THE SOCIETY'S JOURNAL.
PUBLISHED MARCH 14TH, 1870.]

I.—*Notes on Manchuria.* By Rev. ALEXANDER WILLIAMSON, B.A.

Read, November 23, 1869.

MANCHURIA may be said to lie within N. lat. 39° and 49°, and E. long. 120° and 133°. These lines embrace the limits in both directions, but the bulk of the country lies like a parallelogram across the map N.E. by S.W., and measures approximately 800 miles in length and 500 miles in breadth. It is bounded on the south by the Gulf of Pe-chili and the highlands of Corea; on the east by the River Usuri, which divides it from the newly acquired Russian territory; on the north by the Amoor, and on the west by the rivers Naun, Soongari, and the South-Western Palisades. It is divided into three provinces, viz., Liau-tung, Kirin, and Tsi-tsi-har, or, to suit English ears, the Southern, Central, and Northern Provinces.

SOUTHERN MANCHURIA.—I have paid three visits to this country,—the *first* in the spring of 1864; the *second* in April, 1866, when I travelled from Newchwang overland to Pekin; and the *third* this autumn (1867), on which occasion I made two journeys, the one northwards, *viâ* Haï-chung and Liau-yang, to Moukden (also called Shin-yang), the capital of Manchuria, and the other round the promontory, crossing it lower, going as far as the Gate of Corea, and visiting every place of any importance both on the seaboard and inland. I am the more disposed to publish these notes as I have found it a country of much interest and great promise, and not that barren, bleak, and lawless country generally supposed.

Surface viewed in reference to its Natural Characteristics.—Southern Manchuria may be divided into two distinct regions,—the one comprising a plain, and the other comprehending an elevated country full of high mountains. A line drawn from King-chau (lat. 41° 12′ N., long. 121° 10′ E.) north-east to Shin-yang, thence south by west through Lian-yang and Hai-chung to Kai-chau and the sea, will divide these two unlike districts, and give you the level country on the south and the mountains on the north and east. The former is an alluvial deposit, extremely fertile, except contiguous to the sea, where that saline exudation so common in the north of China interferes fatally with the productions of the soil. The other portion consists of huge mountain masses, interspersed with fertile and sometimes extensive valleys. The masses of mountains appear to be in no determined direction, but careful observation shows that the prevailing line is north by south, while there are several ranges of great length whose direction no one can mistake, and which lie north by south or north-east by south-west. As may be supposed, the character and aspect of these two portions of Manchuria differ very much. The plain is monotonous, and in some places dreary, especially in proximity to the sea; yet it has its charms. Fine crops of tall millet and other grain, large villages with their clusters of trees and a busy population, relieve the eye in summer; and numerous lagoons covered with reeds and swarming with water-fowl of every description, render it somewhat interesting even at the bleakest season of the year. The soil generally tends to be swampy, and few travellers fall in love with the region, for one day's rain will often make the roads utterly impassable for carts, and the wight caught in such a misfortune has a sad time of it; his cart floundering out of one black pool into another, now in the road, then in the fields, plunging and splashing away at the rate of one mile an hour, men, beasts, and carts covered from top to toe with mud.

The hilly country is extremely picturesque,—ever-changing views, bounding torrents, fountains bubbling up now and then, varied and abounding vegetation, flocks of black cattle grazing on the hill-sides, goats perched on the overhanging crags, horses, asses, and sheep on the less elevated regions, numerous well-built hamlets everywhere enliven the scene; and if you add to this a glorious, clear, blue canopy overspreading all, and fine bracing air, you will have some idea of the enjoyable nature of the region, especially in the spring and autumn. Again, while the hill-country differs widely from the level plain, the eastern side of the promontory differs in a perceptible measure from the western. The watershed is not in the centre, but much nearer the western shore. Making a rough estimate, one-third of the country lies toward the west, while two-thirds appear on the eastern side. This affects the climate, the fertility of the soil, and the productions of the country.

Towards the east and south-east the slopes are more gentle, and consequently more exposed to the rays of the sun, which, of course, in many ways heightens the fertility of the soil and increases the luxuriance of the crops. Moreover, lying south-east they receive the south-west monsoon, laden with its fructifying vapours, and are thus richly watered year by year. In consequence of this we found the country luxuriant in crops of all kinds of grain, and especially yielding a tremendous amount of Indian corn. The farm-steadings were overflowing with it, and it is exported in great quantities to Shantang and the south.

Climate.—The climate of Manchuria presents the extremes of heat and cold. In summer the temperature varies from 70° to 90°, and in winter from 45° above to 10° below zero. The rivers are generally frozen over by about the 20th November, and are not navigable till the middle of March. The crops grow and come to perfection in a few months, and by the end of October everything is safely housed. The winter generally begins with a snowstorm; after which the weather clears up, and hard dry frost sets in, which continues, with the relief of a fall of snow now and then, till the sun asserts its supremacy. This season is very enjoyable, warmly clad you can scour the country in all directions—marsh, lake, or river presenting no obstacle. Carts go in a straight line wherever they please, and it is during winter that the great bulk of the pulse crop is brought down to the seaports, and there stored for shipment when the rivers open. Such in general is true in reference to climate, but the physical character of the country produces some modifications. Among the hills the extremes are not so great, the summer heat, especially, not nearly so intense. Moreover, in the plains or basin of the Liau River the variation of the temperature is much more felt. In summer the flat surface, hardened by the sun, reflects its rays, and in winter radiates the cold; and yet even at Ying-tsze (Yin-koa), the least pleasantly situated spot, the climate is extremely healthy. My esteemed friend Dr. Watson assures me that serious sickness is very rare amongst the foreign residents. In several places on the eastern coast, especially in the neighbourhood of Siu-yen and north and eastwards, the climate is comparatively moist. The high ranges of mountains appear to attact and condense the clouds, so that the atmosphere there is more like some parts of Europe than Asia. I mention this, as every one knows that a moist climate is a great desideratum in the north of China.

In illustration of these remarks, and before proceeding to give a brief account of the animals and vegetation of the country, I am happy to be able to add the undernoted *Table* *of Temperature* and remarks on the climate, taken by permission from the Trade Reports of T. T. Meadows, Esq., H.M. Consul at Newchwang for 1865:—

TABLE OF TEMPERATURE.

Month.	COLDEST.		WARMEST.	
	Morning, at Daybreak.	Afternoon, from 2 to 4 o'clock.	Morning, at Daybreak.	Afternoon, from 2 to 4 o'clock.
	°	°	°	°
January ..	−10	3	39	44
February ..	−10	7	35	50
March	0	14	43	60
April	27	41	53	68
May	41	52	65	74
June	57	70	76	84
July	62	74	79	87
August ..	63	73	77	85
September ..	41	52	73	80
October ..	28	42	66	71
November ..	7	17	52	61
December ..	−6	2	37	44

"These observations were all taken from Fahrenheit's thermometers, suspended on the northern faces of house walls, on which the sun never shines, therefore the coldest and coolest places. The coldest months are January, February, and December. The greatest cold may occur in any of these months; but is most likely to occur in January and first half of February. The warmest months are June, July, and August. The greatest heat of a summer may occur in any of these months, but is most likely to occur in July or first half of August.

"The number of days in any one winter on which the thermometer stands at daybreak below zero does not exceed ten, and it is rarely below zero for more than two mornings in succession. In the coldest winter afternoon it always rises above zero.

"In a cool room with Venetian blinds the temperature does not rise above 80° except for a few hours during some 25 or 35 afternoons in each summer, and these comparatively hot days do not occur together, but are distributed, with cool intervals, in periods of four or five days each throughout June, July, and August. In these months the temperature always falls below 80° at night. In exceptionally hot summers, as in 1862, the thermometer may stand at daybreak at 75° to 79° for some 20 days. In cool summers it rarely stands above 70° at daybreak. As to the highest temperature in these tables, 87°, it has only once been attained in my library during the five years of my residence, and that was 31st July, 1862. The prevailing winds in summer are south-south-west.

Fauna and Flora. In illustration of these remarks on the climate, and also by way of corroboration, I may mention a few things connected with the *fauna* and *flora* which greatly interested me. I met with many plants and shrubs which I little expected to find in that country. To mention only a few which all can appreciate: one of the first which strikes the visitor on landing is the common dockweed, thistle, and dandelion, and these prevail more or less all over the country. As you proceed inwards you meet several varieties of the daisy, only somewhat more scraggy than "the wee modest crimson-tipped" flower at home. Rushes are found in all wet localities, and, strange to say, their stalks are all triangular and not round. Gaining the dry elevated soil you meet with the iris and pink, and the true Scotch thistle, which we found in several localities far removed from one another, and when you get on yet higher ground and follow the course of the valleys you find the blue-bell hanging in huge clusters on the sides of the ravines, and the larkspur and other familiar flowers growing in wild luxuriance. Once fairly among the hills your astonishment reaches its climax—the hawthorn flourishes in great abundance and beauty, the dog-rose attracts attention, peeping out here and there among the brush-wood; ferns in the shade of the rocks, or clustering round the roots of trees, or half-covered by the shrubs, surprise and interest the traveller. The mistletoe, that beautiful parasite consecrated by Druidical superstition, and hallowed by the yet more sacred associations of happy Christmas, is found in profusion in many of the valleys, especially about Kai-chau, and between Fung-whang-ching, and Hai-chung. The common willow (here a tree of considerable size and importance), the oak, birch, ash, white pine, common fir, hazel, and varieties of well known brush-wood, as brambles, &c., are found in all directions, and the sombre yet elegant weeping willow, growing generally in the neighbourhood of hamlets, adds a charm to the scene:—

"Tow'ring o'er the Newton woods
Lav'rocks fan the snaw white clouds,
Siller saughs wi' downy buds
Adorn the banks sae briery.
Round the sylvan fairy nooks
Heath'ry breckens fringe the rocks,
'Neath the brae the burnie jouks,
And ilka thing looks cheerie."

The similarity is strange, and were a school-boy transported to this region in autumn he would hardly recognise any difference. He would find hips and haws and hazel-nuts, to his heart's content, and the cry of pheasants and the song of birds would still more deepen the illusion. One thing is worthy of remark, the haws are somewhat larger than those at home, and sometimes, as in Shan-tung, as large as a crab-apple, but are nevertheless true haws. They are often dipped in boiling sugar and sold in streets, sometimes made into jam, but often eaten raw. The hips are the same as at home, having a covering of that delicious red albumen so delightful to boyhood. Various other kinds of berries were found, such as a species of sloe; the only tree really conspicuous by its absence was the rowan tree. The *fauna* does not present such striking resemblances, though it comprehends many familiar animals. The fox, wild cat, and hare are common, but then in contrast to them are the tawny striped tiger, averaging 10 feet to root of tail; the wolf and wild boar abound towards the north, and on the confines of Corea. The feathered tribes are more like our own, such as wild geese, ducks, teal, snipe, &c. &c., pheasants, partridges, multitudes of common crows, the jackdaw, the solitary raven, magpie, pigeon, wild and tame, larks, thrush, linnet, &c. The barn-fowl are of the same species as our own, not that long-legged lanky Cochin China fowl, but the round, plump, decent Dorking. One bird deserves especial notice, inasmuch as I have not found it described even in recent works on natural history. It is a species of lark, having the long straight hind spur peculiar to that genus, but at the same time possessing all the faculties peculiar to the mocking bird. It is a native of Manchuria, and is exported in great numbers to the northern provinces of China. It is highly prized by the Chinese, and there are few families in the north but possess one or more. It may be seen in a cage hanging over the door, and frequently the youths carry them about in their walks for their amusement. It readily learns to mew like a cat, or bark like a dog, and quickly picks up all sorts of noises which are common in its neighbourhood. It imitates all the neighbouring birds to perfection, and most amusing is it to hear it trill out all their songs and cries, one after another, in rapid succession. Sometimes it introduces variations, as the cry of animals, and pell-mell—

> "In one sequence of melodious sounds
> Pours out all its muse."

The bird is somewhat larger than the common lark, has a thick short bill, slightly hooked upper mandible, is characterized by a white collar round its neck, black spot on the breast, whitish belly, earthy brown back, with some white feathers in the wings, while the long outer feathers of tail and wings are black. It builds on the ground among the long grass, sings only in spring and first part of summer, and possesses all the other features of the true lark.

Rivers.—There are only two rivers of any importance in this quarter of Manchuria, viz. the *Liau Ho*, and the *Ta-yang Ho.* The former rises in Mongolia, and after pursuing an easterly course of about 400 miles turns southwards and pours its waters into the Gulf of Liau-tung. Within 150 years large junks used to go up the river as far as the city of New-chwang, but owing either to the accumulation of debris, or, as I am rather inclined to think, in consequence of the rising of the country, they can only now reach the town, called Ying-tsze (Yin-koa), where the foreign settlement is, about 20 miles from the bar. Here, however, there is plenty of water for ships of large tonnage, and the river is about 650 feet wide. The tide affects the stream for many miles; good sized junks can yet ascend to Tien-chwang-tai, and boats as far as Moukden. On the Moukden branch, while small junks can yet ascend as far as *Tie-ling*, on the main stream, at high water there is about 16 feet on the bar. The other river rises among the hills, about lat. 41° N. and long. 123° 30′ E., receives a great many minor streams, but especially one from the borders of Corea, flows south-east, and pours its waters into the Yellow Sea. At first rapid, owing to the conformation of the country, it gradually becomes slower as it nears the ocean, and for the last 15 miles of its course is rather an important river. The tide also affects it for this distance, and it is fully taken advantage of for the purposes of commerce.

The Great Highways.—First among these stands the Imperial Highway, which runs from Pekin, through the Great Wall at Shan-hai-kwan, along the shore of the Gulf of Liau-tung, on to Moukden. Thus far it has watch-towers every 10 li ($3\frac{1}{3}$ miles), regular guard-houses, and all the appurtenances of the great roads—only, like the rest, it is now in a state of decay. Passing through Moukden this highway sends off a branch to Corea, while the main-road continues on to Kirin, where it again bifurcates, one branch going *viâ* A-she-hoh to San-sing, the limits of the empire in this direction, and the other *viâ* Ninguta and Hun-chwen to the sea at Possiet.

The second great road runs from Ying-tsze, the port of New-chwang, through Moukden, where it diverges north by west to Fa-kwho-mun, thence through Mogolia to Koong-ying-tsze, and Pe-tu-na, and thence on Tsi-tsi-har, Mergen, and the Amoor.

A third great road proceeds from Ying-tsze to Kai-chau, thence south to Foo-chau, where it divides—one branch going south to Kin-chau and end of the promontory, and the other south-east, to Pi-tsze-woa. Another road goes from Ying-tsze *viâ* Siu-yen to Fung-whang-ching and the Gate of Corea.

Besides these there are minor roads in all directions to all the chief villages, and by means of them you can go entirely round the promontory.

These roads may be said to be in a state of nature—no one looks after them—nor is there any toll, except at the Passes leading into Mongolia. The weather rules them. In the level districts they are just lines of deep ruts, irregular and uneven, which, in course of time, would become utterly impassable. But the rain obviates this evil, by washing them all into a common puddle, when it ceases. Carts then plunge through them, leaving new tracks. The sun hardens them, and this process of repair is perpetually repeated, and it is all they receive.

They are provided with good ferries at all the rivers, and the inns that occur every few li are much better than the same hostleries in Shan-tung and Chi-li.

Chief Cities.—1. Moukden (lat. 41° 40′, long. 123° 50′), more commonly called Shin-yang, or the capital of Manchuria. It lies on the north of the River Shinorn, affluent of the Liau Ho, and is very pleasantly situated. It is a large city with high gates; the streets are well laid out, full of good shops. Being the chief city of the province, all kinds of produce peculiar to the country find their way to it, and it is thus an emporium of native goods, the seat of considerable distributing trade of all descriptions. We found many foreign commodities for sale, such as Russian cloth, Manchester goods, foreign iron, watches, &c. Fur shops, full of fine furs, were found in great numbers in the Great East and West Street. There were also several large book-shops, speaking well for the literary tastes of the people. There was a bell and a drum-tower, and all the paraphernalia of a provincial capital. The city was full of people, and everything had a well-to-do appearance about it. The southern and western suburbs are likewise very extensive. 2. King-chau-foo, lat. 41° 12′; long. 121° 10′. This city stands next in importance. It lies not far from the sea, and has a considerable trade in general goods. It has been described in a former paper. 3. Liau-yang, lat. 41° 18′; long. 123° 10′. This city, once the capital, embraces within its walls a large area of ground, much of which is now laid down under cultivation, chiefly as vegetable gardens. In the centre of the city, however, there are many large and excellent shops, and there appears to be a good amount of country trade. 4. Hai-chung, lat. 40° 52′; long. 122° 40′. This city, much smaller in circumference than Liau-yang, has about an equal amount of business. The shops were well stocked and the people well to do. 5. Kai-chau, lat. 40° 30′; long. 122° 18′. This city is more compact than either Hai-chung or Liau-yang, and has a considerable trade. It lies not far from the sea, and a good many junks visit the seaport which is connected with it, and thus there is some import and export trade. 6. Foo-chau, lat. 39° 50′; long. 121° 38′. This is a neat well built city, but of little importance, except as the centre of some country trade. 7. Kinchau, lat. 39° 10′; long. 121° 36′. Larger than Foo-chau, walls equally good; it has about the same amount of business, but is a much less pleasant city. It is washed by the sea, but owing to the character of the coast no junks can trade in the neighbourhood. They accordingly visit the smaller seaports on the south-west, or Ta-lien-whan Bay on the south-east. 8. Siu-yen, lat. 40° 15′; long. 123° 18′. Fung-whang-ching, lat. 40° 32′, long. 124° 11′; and New-chwang, lat. 41°, long. 122° 30′. These cities possess one important feature in common, and one quite unlike those above described. The former are *bonâ fide* Chinese cities, within high walls, with good gates, &c., but these are peculiar in this respect; that the city proper is a comparatively small square enclosure, with a moderately high wall, occupied almost exclusively with the mandarin offices, while all the business is done in the suburbs, which are extensive and regularly laid out. The chief street in the suburb of Siu-yen is about a mile long, and contains many good shops. It is famed for its finely veined stones, and many find their occupation in cutting and polishing marble ornaments of various descriptions. 9. Fung-whang-ching. This city has a good country trade, and exceeds Siu-yen in population and importance. Being nearest to Corea, it has gathered some notoriety as the emporium of Corea goods, and is the first place where the Chinese and Corean officials exchange courtesies, as the embassy from the latter country passes on to Pekin. 10. The native city of New-chwang is larger than either Siu-yen or Fung-whang-ching, but the suburbs are much less extensive. The place is famous for its excellent water, which is used in the manufacture of spirits, and is also noted for the production of saltpetre.

Seaports.—As might be inferred from the character of the country, there are many seaports of less or greater importance all over the coast, but there are only three of any note. The first and chief is Ying-tsze (Yinkoa), on the Liau Ho, where the foreign settlement is established. The main street of this is fully 2 miles in length, the native warehouses are most extensive, and the trade is very large. Junks from all quarters visit it, and the foreign shipping is now considerable. The seaport next in magnitude is Ta-koo-shan, lat. 39° 55′, long. 123° 50′. This town is on the Ta-yang Ho, and lies about 12 miles from the Yellow Sea. Like Ying-tsze it possesses many large native warehouses, and is the medium through which a tremendous amount of produce from the north is exported. It competes with Ying-tsze in soliciting the trade in pulse and brancake, but is not likely to succeed. At the same time we met great quantities of goods on the way to this port, which, as far as we could judge, could as easily have been conveyed to the other. There was a great amount of native shipping in the harbour, but chiefly junks of second and third class. Opposite the port the river is about 1100 yards wide, a fine broad flowing stream. The tide rises and falls a good many feet, thus facilitating navigation, but the bar is more formidable than at Ying-tsze, so much so that large southern junks find it advisable to discharge their cargoes outside. Like Ying-tsze, the river is frozen over from the end of November till March. Another harbour of some note is that called Pi-tsze-woa, lat. 39° 18′; long. 122° 18′. This port is situated on the sea, and the harbour is pretty well defended from winds from all quarters by a series of rocks, which form a semicircle around it. Unfortunately the water is shallow, and many of the junks are left high and dry when the tide is out. This could be remedied by a pier, and it would be worth while to construct one, for this place has the great advantage of being open all the year round. The warehouses here are also large, and the import and export trade considerable.

Villages and Hamlets.—Villages of any size are much less frequent than in China (except in some parts of the alluvial plain), and instead of them we have hamlets of a few houses here and there all over the country—embryo villages, which one day will doubtless rival their progenitors on the mainland. They are generally situated in pleasant localities, and are well-built of good stone, having farm-yard, dwelling-house, and everything complete. As a rule, the people are peaceably disposed. In all our travels, in regions near and remote, in the plain and among the mountains, we have never met the slightest molestation whatever. We have heard of robbers and mounted banditti, but have had the good fortune not to have met with one.

Population.—T. T. Meadows, Esq., her Britannic Majesty's Consul, who has travelled extensively over the province, and who is now on an arduous journey towards Tsi-tsi-har, estimated the population to be about 12,000,000. Putting one thing with another I am inclined to think the numbers not far wrong. The population consists of Manchus and Chinese. Originally the abode of the former, they have in a great measure migrated northwards, and the country has been occupied chiefly by immigrants from Shantung. A proportion of the aborigines still remain; in some places as many as one in three, in other places one in ten, and so on in various ratio; but those who have remained behind have invariably settled down either as farmers or in some other definite occupation, and are assimilating themselves to the Chinese in almost every respect. Some few of the more aged still speak the Manchu language, but in addition they all speak the Mandarin colloquial, and the youths are taught from Chinese books in their schools, just as over other portions of the empire. In some places youths are instructed in the Manchu character after they are acquainted with the Chinese, but such instances are rare, and the language is evidently dying out. The prevailing portion of the inhabitants are thus Chinese, and have introduced all the peculiarities of their fatherland into their adopted country. The population being less dense, the soil fertile, the country new, they have more money to spare than in Shantung and elsewhere on the mainland, and on the whole are extremely comfortable. The head men of hamlets generally club together and invite over some poor scholars from their native district to instruct their progeny, and thus education is diffused among them as well as in the cities. Year by year great numbers of coolies come over, and make high wages as labourers. Some go back, carrying their earnings with them; while others invite their families over, and settle down permanently. Thus annually they add to their numbers. When travelling among them it was interesting and amusing to find them eagerly enquiring of my assistants, who were from Shantung and Chili, where they came from; and if it happened, as it often did, that one or other was acquainted with their native districts, they at once had no end of questions about their kindred and friends, just as old colonists all the world over besiege emigrants fresh from home.

Industrial Pursuits.—The bulk of the population is engaged in agriculture and in trades bearing upon that pursuit, such as blacksmiths, wrights, carters, &c. Some are employed in mining operations and others in fishing, but these are a mere fraction of the population. Cotton cloth and silk are manufactured to some small extent, but that is performed by the farmers and their families in their leisure time. Their crops raised are diverse and important.

Wheat.—Whenever spring prevails, wheat is the first thing attended to. It is sown at once, and is ripe by the beginning of June. The ground is then again prepared and pulse put in, which in its turn is ready for harvest in October. Thus they have two crops. After the wheat is sown, they prepare for their millet, maize, potatoes, &c., of which they have only one crop.

Cotton.—This important article of commerce is grown in several places in considerable quantities. The chief producing districts are first, Kin-chau; second, Hai-chung and Liau-yang; third, Hyoung-yoh, south of Kai-chau. The staple is very fair and the colour very good, and it could be grown in much greater quantities if necessary. They plant the seeds towards the close of April, and pluck the cotton in October. They steep the seed in liquid manure before sowing, but this is the sum total of all the labour expended upon it. They never irrigate it, but leave it to the influences of the weather.

They express oil from the seed, which they use for a variety of purposes. The refuse, in the form of small cheese or cake, they use for feeding cattle, the roots and stalks and branches they burn for fuel, and thus they utilise every particle of the plant. As I have elsewhere hinted, seed from this region might grow and be remunerative in many places of central Europe.

Silk.—The mulberry-tree and the silk produced from it are very rare; but the common coarse porjee silk can be had in any quantity, and could be grown to any extent among the mountains hitherto unused for that purpose; but I need say nothing in reference to these matters after the able report of T. T. Meadows, Esq., her Britannic Majesty's Consul at New-chwang, to which I beg to refer the reader.

Indigo.—This is produced in tremendous quantities in that district of country which lies to the north of Moukden. We met strings of carts of seven and eight mules each, day after day on our journeys, conveying this commodity to the south for sale and exportation. Each cart carried about 2000 catties, and we met from 20 to 30 carts *per diem*, so that the sum total must be something prodigious. Though produced in great quantities in the above-named district, it is by no means confined to that locality. We found it in several places in the centre of the country, and on the north-east coast. The quality appears to be excellent, and it deserves more attention at the hands of our merchants.

Tobacco is grown extensively in all directions, and is exported in great quantities. It is highly relished for its good flavour, and brings a good price in the south.

Minerals.—Not only is the soil fertile and the crops varied, the country underneath is rich in mineral resources. Coal prevails very extensively in all parts of the country. We found it both in the north and south in common use among the people. One of the chief producing districts lies on the north-east of Liau-yang. In this locality two places stand out prominently —one called Ma-kia-kow, about 60 li, or 18 miles, north-east of that city, and the other, Pun-hi-hoo, about the same distance from the former place in the same direction. Large quantities of coal are mined in these places and distributed all over the country. The coal is good and used for all sorts of purposes. Another producing district lies 90 li south of the city of Foo-chau, in close proximity to the coast. Junks can come close to the pits, and thus great quantities are exported, especially to the eastern portion of the province of Shantung. The seams appear to be of great thickness. In reply to my inquiries, the people informed me that they could not speak definitely on this point, that the coal existed in all directions and in the mine was not only in front of them but above and beneath them, and that they dug out from the heart of it. Referring to the state in which the coal was brought out, chiefly small, they said they could not mine it in lumps, but referred me to another region where coal was obtained in large pieces. In addition to these two localities, which are in active operation, I heard of others which have been mined up to a very recent date, but now closed. The one alluded to with the greatest interest by the natives lies in lat. 39° 30′, long. 121° 58′, called Po-la-dien, a place near the centre of the promontory. Here coal had been mined up to the middle of last year, and the quality was reported to have been very fine. Another place was the smallest of the two islands to the south-west of Kin-chau, called Sian-yen-tan, and yet another contiguous to the sea in the Ta-lien-whan Bay, south by east of that same city. Besides these, coal is also reported to exist to the east of the Ta-yang Ho.

Peat.—This fuel exists in great abundance along the east of the promontory. We found it in use at the seaport of Pi-tsze-woa, and were not a little surprised to find such a commodity in this country; but our wonder and amazement reached its point of culmination when, two days afterwards, we found it at every inn—huge stacks of it carefully built up in every farmyard, a "peat reek" perfuming everything, and at last entering a peat-bog which continued along the line of the great road for fully 50 miles. We saw the cuttings from which it was obtained, and walls of peat of great height in process of drying. The peat is the good black, not the brown variety.

Iron.—Two districts are famed throughout the country as producing this metal. The first, Pun-hi-hoo, where coal is likewise mined, and the other about 18 miles south-west of this, called Sa-ma-gi. The iron differs in quality—that yielded by the former place being much harder, and taking on a finer edge and polish than the latter. The ore must be extremely abundant in these places, as, excepting what has of late been bought at the foreign market, they supply the wants of the whole country. Though the production is at present confined to the two places just named, it must exist in many other localities. One place we know, viz., that island on the west of the extreme end of the promontory, called the Liau-ti-shan, or the "honourable iron hill," which contains magnetic iron-ore, if not wholly composed of this material, as it affects the compasses of ships which sail too near it. This, no doubt, is related to that fine magnetic ore which abounds on the opposite coast of Shantung.

Gold.—As might be anticipated, this precious metal is no stranger. It is found in many places towards the south of the promontory in greater or lesser quantities; but the most famous district is that on the east coast to the north of the Py-li River. Here we passed over gold-diggings and a gold-producing country, about 40 miles in length by 10 broad. Last year a serious quarrel arose among the gold-seekers, which resulted in murder, and on this account the mandarins interfered and put an end to the occupation for the present. We also heard of gold at Kin-chau, which may be interpreted the "gold-district city."

Silver, Copper, Lead.—Silver is said to exist in the mountains to the west of Liau-kia-kow, lat. 40° 2′, long. 122° 10′, and also in other places; but, of course, it was impossible for me, passing through the country, to obtain much definite information as to metals of this kind. There can be no doubt of their existence—the nature of the rocks, the direction of the mountains, the fact that they abound in Shantung and Corea, still point to the certainty of their presence. But not only so—there are other circumstances which lead us to the same conclusion. As we have seen, the prevailing direction of the mountain ranges is north by south, or north-east by south-west. This harmonises with the line of mountains in Japan, Formosa, Loochoo, and Aleutian Islands. Moreover, as M. Elie de Beaumont has shown, "it coincides with the great circle of the terrestrial sphere which passes by the Cordilleras of South America and the Rocky Mountains of the north, whence we may infer that the mountain system of Oriental Asia and that of the Great American chains are of the same date." But a still more important influence appears equally evident. The mineral wealth must be distributed in similar proportions in both continents. We know this to be true of coal and iron, which are always the first minerals to be discovered; for in no quarter of the world, except America, have we such extensive coal and iron fields as in China, and there is little doubt that the magnetic ore in Vancouver's Island is the same as that which abounds in North China. The same appears true also in reference to gold. California and Columbia lie in nearly the same parallels of latitude on the opposite coast of the Pacific Ocean, and the distribution of gold here appears quite equal to that in America. It is found in the affluents of the Yangtsze Kiang, on the extreme west; in Shensi, where the Jesuit fathers tell us that an infinite number of people gained their livelihood by it; it abounds in Shantung, Corea, Japan, Manchuria, and not only so, but there are great gold-diggings scattered here and there over Mongolia and Siberia. Few knew aught of the great extent of the coal and iron, and no one had any idea of the abundance of silver, copper, lead, &c., in the

Western States, till the recent scientific investigations appointed by the American Government disclosed their hidden treasures; and so we venture to predict, that were a similar investigation to be made here, it would lead to discoveries equally astounding.

Commerce.—Under this head I beg to refer the reader to the Trade Reports sent in from time to time by Mr. Meadows, and also to the valuable memorandum presented by Mr. M'Pherson in the Custom-house Returns for 1865. Since, however, this may fall into the hands of some who may be unable to procure these papers, I subjoin the following Table from the Custom-house Returns for 1866:—

NEW-CHWANG.

IMPORTS.	1866.		1865.	
	Pieces.	Taels.	Pieces.	Taels.
Cotton piece goods:—				
Shirtings, grey	30,450	..	30,230	..
Shirtings, white	4,450	..	9,600	..
T cloths	2,650	..	12,308	..
Other descriptions, total value	..	153,789	..	156,507
Woollen goods	..	34,552	..	58,900
Camlets pieces	300	..	708	..
Habit, broad and mid. cloth, and Spanish stripes	204	..	645	..
Lastings	645	..	..	..
Tongills, lustres, &c.	1,405	..	3,414	..
Opium peculs	2,671	1,708,310	1,518	897,882
Sugar and candy ,,	36,169	181,071	45,492	244,433
Iron, nailrod, and bar ,,	19,384	53,395	14,807	46,268
Window glass boxes	1,630	4,075	3,607	7,018
Sundries, value	..	211,575	..	273,144
Total taels	..	2,346,767		1,686,176

EXPORTS.	1866.		1865.	
		Taels.		Taels.
Rice peculs	..	..	37,728	75,456
Bean-cakes pieces	1,753,733	666,418	1,787,978	806,586
Beans and peas peculs	746,732	897,081	901,320	1,031,050
Bean-oil ,,	3,998	18,394	11,040	72,759
Barley ,,	3,729	5,593	3,418	10,254
Millet ,,	27,888	16,733	34,078	27,262
Cotton ,,	..	..	309	11,333
Ginseng ,,	154	28,378	84	15,188
Shamshoo ,,	5,108	12,774	2,667	10,672
Melon-seeds ,,	6,476	19,431	2,442	7,332
Sundries	..	255,128	..	58,442
Total taels	..	1,919,930		2,167,314

The trade for the year 1866 stands thus: imports, value taels 2,346,767; exports, 1,919,930: total, 4,266,697. This only includes what was shipped in foreign bottoms at the port of Ying-tsze. Supposing the goods shipped in junks at that place to equal that in foreign vessels and all the other seaports taken together to be one and a half more than the native junk-trade at that port (a very moderate computation), it would give taels 14,933,439, or nearly five millions sterling, as the sum total.

Those who have followed me so far must often have thought of Canada in comparison with this country. They possess many points of resemblance. A climate similar in its general features, an equally fertile soil, yielding similar crops, and each having a northern territory famous for its furs, each drained by a great river and possessing a variety of minor seaports. But in some respects Manchuria bears the palm, the climate is a shade less severe, it probably possesses greater mineral wealth, produces cotton and silk unknown in that dependency, and in addition has seaports on the south which are open all the year round. I make this comparison to bring the matter home. How important has Canada been esteemed, and how poor our appreciation of the other! And yet the latter is the richer of the two.

The Development of the Country.—Having thus surveyed Southern Manchuria, the question naturally arises, how can the resources of the country be best developed? I am not forgetful of the proverb, *Ne sutor ultra crepidam*; but, having travelled over the greater portion of the country, and become naturally interested in its people, I may be pardoned for making one or two suggestions on this point. Utopian, though it may seem, yet believing as I do in the *law* of advancement which Almighty God has imposed upon man, and which is so rapidly working itself out in these days, I venture to suggest as the first and chief means towards the opening up of the country, that a railway be constructed commencing at *Ta-lien-whan* Bay on the southern point of the promontory, and proceeding northwards viâ Kin-chau, Foo-chau, Kai-chau, Hai-chung, Liau-yang, Moukden, and on to the pulse and indigo producing districts in the north. Nature would seem to have provided for this, inasmuch as from the point mentioned on through the busy cities I have indicated, there is a succession of valleys running north and south, so that there would be no need for tunnelling and little need for cuttings. A few insignificant ridges, which would require only slight gradients, being the only obstacles of any importance. Reaching Kai-chau, the country beyond northwards is a level plain. This line would thus command the commerce of the whole country, it would have minerals along its whole course, and a coal-field at Ta-lien-whan Bay, its southern terminus. Ta-lien-whan Bay is well known for good shelter and depth of water, as it was the rendezvous of our fleet during the winter of 1859. It is open all the year, and so obviates that stagnation which lies as an incubus upon energy for so many months in the year. For many reasons the present port, Ying-tsze, would never do in the new order of things; the bar at the mouth of the river, the fact of its being frozen up for fully four months every year, independently of the apparent shallowing of the water resulting at once from the accumulation of silt, and the rising of the country, which must end in leaving that market like its predecessors, high beyond navigable limits, would infallibly remove business to the more eligible spot. Again, a railway would provide for the permanent security of the country, bring producer and purchaser face to face, prevent illegal imposts, and in ten thousand other ways benefit the people. The necessity for the former consideration was powerfully forced on my attention during my last visit. Towards the close of the summer, only two months before my visit, 200 robbers landed from a junk at Ta-koo-shan, and billeted themselves upon that populous town and levied blackmail. I could hardly believe it, yet so it was. A portion of them had stayed in the same inn where I lodged, and not only made a most exorbitant demand upon the townsmen, but had every requirement complied with. Eight of them appeared one morning at another small seaport, Ta-chang, through which I passed, and demanded 1000 taels each, with the threat that if not forthcoming immediately their comrades would come down and burn the place. They got the money at once, and in this fashion they went over the country for some time till soldiers came from Kirin, or rather till they themselves were pleased to go. They then embarked in a large junk, and by a clever trick (as I believe) got the gunboats (English and French) at Chefoo, to start on a wild goose chase to the Miau-tau Islands, then, the coast being clear, came into this port (Chefoo) in a heavily armed junk with good papers, refreshed themselves, and then made off to the south. They were called the "hong-hu-tsz," or "red-bearded robbers." I asked for an explanation of this name, and was informed that they had their faces painted red, and coloured horse-hair for beards. What applies to Manchuria applies to the whole of the north of China; fifty well-mounted robbers could ride through the length and breadth of the land. There is no sense of security, no one knows in what direction they will move, they come nearly as quick as news can travel; in fact generally announce their own arrival. In consequence of this the people bury their silver and gold, transport their clothes and valuables to strongholds, and content themselves with the bare necessaries of life. In such a state of matters no trade can flourish. And not only so, traffic is not safe, even on the most important highways. Witness the newly appointed Chinese minister, Mr. Burlinghame, who was intercepted by mounted robbers under the very eyes of Pekin, between the capital and Tientsin. Something must be done immediately, otherwise disorganisation will increase and commerce vanish, and it must be something powerful and thorough, not the extension of the foreign inspectorate, not the building of arsenals and naval dockyards on the coast, not the training of a few paltry bands in foreign drill and such things, not the medicating the surface while the disease is in the vitals and widely spread over the whole body corporate. A bold stroke must be made if the country is to be saved, and I again submit that in view of its extent, the wide diffusion of foreign ideas, arms, and modes of warfare, a railway scheme is now a *sine quâ non.*

Again, China needs young men of education and integrity to aid in developing its mineral wealth, and in the manufacture of its staples. Here then would be a new field of enterprise opened to engineers, machinists, and others of comparatively little capital who might come out, and by entering into engagements with wealthy Chinese firms, at once secure their own fortunes and help in the advancement of this great people. Such a scheme would be looked upon askance by capitalists at home and merchants in China as a thing likely to mar foreign trade. But it could do this only for the moment, and the result undoubtedly would be advantageous for all. In any case it must come to this, and merchants must prepare for its advent. Once acquainted with their own resources, cognisant of the fact that the erection of manufactories on the spot would greatly benefit themselves, and permitted by a wise and fostering government, the Chinese are sure to enter on this path.

CENTRAL AND NORTHERN MANCHURIA.—*Extent and Boundaries.*—In the former part of this paper I endeavoured to give some account of Southern Manchuria, and now I add some notes taken during a long journey through the Central and Northern portions of the country. For the sake of clearness and brevity, I shall first give an outline of my route as indicated on the accompanying map, and then speak of the various things which appear worthy of remark, under separate heads.

Starting from Ying-tsze, the port of New-chwang, we travelled north-east to Moukden, thence north by west to Fa-kwho-mun. Passing through this gate we entered Eastern Mongolia, and travelled north by east to Kwan-chung-tsze. Here we diverged north by west to Pe-tu-na, and thence eastward to A-she-hoh.

From this our route lay east by north till we reached San-sing, on the Soongari, the last city in this direction in the Chinese Empire. The Russians have surveyed the river down this length, and have twice or thrice visited this place, so that our explorations and theirs have met, and the whole of this quarter of Asia may now be considered as known. Our intention was to proceed from here due south to Ninguta, but finding that there was no cart-road—only a dangerous bridle-path—not even used by Mandarin runners, with no accommodation, and also ascertaining that boats would occupy too long a time, with no population to work amongst, we were forced to retrace our steps a portion of the way, and then proceeded south to Kirin; thence home *viâ* Ki-yuen, Tie-ling and Moukden; having travelled in all about 1400 or 1500 English miles.

Central Manchuria or *Kirin* is bounded on the north by the Soongari, on the east by the Usuri and Russian territory, on the south by Corea and Liau-tung, on the west by Soongari and a line of palisades, which, by the way, like the other palisades, exist only on the map and in the imagination of his Imperial Majesty the Emperor of China.

There is a sort of gate at the Passes, and a ditch or shadow of a fence for a few yards, but you can ride round and round the whole affair.

The Russians estimate this province at 135,000 square miles in area.

Surface.—Like Southern Manchuria, Central Manchuria may be divided into two portions, the one a level prairie country, and the other mountainous; only the two portions are very unequal in size—the former being all comprised in the north-west corner, within the link of the Soongari, while all to the east of a line drawn from Fa-tuh-ha-mun through A-she-hoh, and on north-east to the Soongari, as well as the remainder of the province in south and west, is full of hills of various magnitude.

The Mountain Ranges.—The chief of the mountain-ranges in Central Manchuria is that called the Shan-alin Mountains. Their highest peaks lie on the south-east of Kirin, where they reach the tremendous height ranging from 10,000 to 12,000 feet, their summits being covered with perpetual snow and glaciers. From this point they run north-east and south-west. Towards the north-east they form the watershed of the Hurka and the Usuri, and afterwards the Soongari and Usuri, and towards the south-west they form the boundary of the plain of New-chwang and the backbone of the promontory. These mountains sometimes rise into hills of great beauty and grandeur, as, for instance, in the hills of One-thousand Peaks near Hai-chung, hills near Sui-yen, and the range from Fung-whang-ching to the Corean Gate. Another range of mountains runs through a portion of Northern Manchuria, enters Central Manchuria about 80 miles east of A-she-hoh, proceeds south by west parallel to the River Hurka—forming a second watershed—then continues its march past Kirin on towards Moukden, where they gradually subside into the plain.

A third range of mountains lies in the Russian territories east of the Usuri and the Amoor. Their highest peaks run parallel to the sea and not far distant from it; so that the streams which flow eastward are not to be compared in size and volume to those which flow westward, and pour their waters into the Usuri and Amoor. This range, as a rule, appears to be higher than those west of it. (These are not to be looked at as single ranges, but rather separate mountain districts, lying in the specified directions, and often forming mountain masses where the mountains appear to be tumbled about in all quarters.)

It will thus be seen that the prevailing direction of the ranges coincides with that of Southern Manchuria, Shan-tung, and, indeed, China in general. One peculiarity of the mountains in this region deserves notice. We repeatedly come on isolated hills in the plains, often perfect cones. These sometimes lie in a line about 15 or 20 miles distant from one another, as, for instance, Siau-ku-shan and Ta-ku-shan, south-west of Kirin, and sometimes dotted over the plain like dish-covers on the table. But whether in range or in solitary beauty, they have a family likeness. The conical configuration prevails, and this shape, together with the peculiarity just noted, extends not only over Manchuria, but into China, affording a still further proof of their geological identity.

The Great Rivers.—Corresponding to the three chains of mountains are three great rivers, viz., the Soongari, the Hurka, and the Usuri.

The Soongari, which is by far the most important, both in reference to length of course, volume of water, and extent of basin, takes its rise on the north-western side of the Shan-alin Mountains, and proceeds in a direction north by west, receiving a great many tributaries from the surrounding hills, and sweeps past Kirin—a majestic river. Passing Kirin its course lies north by west, till it passes through the palisades about lat. 44° 30′, where it enters Mongolia, and takes a decided north-westerly direction. This it continues till it passes Pe-tu-na, where it receives the River Nonni, and there flows east by north, gradually diverging northwards, till it joins the Amoor, or rather till the Amoor joins it; for I am inclined to think that it should be looked upon as the parent stream, inasmuch as it has at least an equal, if not a larger volume of water, and, moreover, maintains its former direction after its junction with the Amoor. Its flow is not uniform, swifter, and more compressed; about Kirin it becomes wider, and more sluggish after entering the Mongolian Steppes. In this quarter it sometimes spreads out over a mile in width, with an average depth of 3 or 4 feet. Here and there it forms numerous islets, and sometimes divides into two branches, which flow nearly parallel, having a belt of fine land between them. Nor does its volume increase in proportion to the length of its flow, owing to the nature of the country and consequent absorption.

We crossed it at four different places; first at Pe-tu-na, where we found it about 1¼ mile in width, but having only an average depth of water of about 3 feet. The second time at about N. lat. 46°, long. 128° 10′, where we found it about 400 yards wide, and deeper than we could ascertain with the means we had—certainly over 20 feet. The third place was at San-sing, where it was compressed into a very rapid, deep river; the fourth place was on our return journey, a little north of Kirin, where we found it about 300 yards wide, and an average depth of at least 12 feet. In the centre we could not touch the bottom as we passed over. This speaks of the great height of the hills in that quarter, for we were not much above 80 miles from its source as the crow flies. Travelling parallel to its course in Mongolia and Northern Manchuria, we thus saw a good deal of it. There were a good many third and fourth class junks here and there on its waters, and it is navigable up to Kirin, and beyond it for some distance; and were it not for these shallows it might be a very serviceable river during the season in which it is open. As it is, a good deal of produce is carried down the stream; but, owing to the immense bend which the river makes, goods are generally conveyed in carts from San-sing, A-shehoh, and the northern markets to Kirin, and of course they also take return cargoes.

The Russians have proceeded up this river in steamers as far as long. 127° E. Some say they have been as far as Kirin, but of this I cannot speak positively.

The Usuri.—The river next in point of size to the Soongari is the Usuri. It rises about lat. 44°, receiving numerous tributaries of more or less importance, and after a course of about 500 miles pours its waters into the Amoor.

At first it partakes more of the nature of a mountain torrent, but it gradually loses this character, and after reaching Sungachau it enters a wide plain. Passing this it again flows through a mountainous district for about 100 miles, where it enters a prairie country, and thus through swamps and steppes flows onward to the Amoor. For a full account of this river see

Veniukof's 'Exploration of the Usuri' in Ravenstein, pp. 234-259. Russian steamers now ply this river weekly up to the Hinka Lake, whence goods are transferred overland to Possiet and Port May. They have also a telegraph along the banks of the river to Kha-bar-of-ka, where it joins the main wire for Central Asia and Europe. They are thus in perfect communication with all their settlements in this remote quarter. They purpose this year placing another steamer on the river Sui-fun, which will materially shorten land carriage to Possiet and Korea.

The Hurka.—The third river is the Hurka, or the Mootwan Ho (the River of the Mootwan flower) as the Chinese call it. It rises about lat. 43°, not far from the source of the Soongari, takes a northerly direction, passes by Ninguta, receives two important tributaries from the west, and one from the east, and then debouches into the Soongari at San-sing. Here at its junction we found it almost 200 yards wide, with a good volume of water. At this city we found several small junks from Ninguta trading with the merchants. The people told us that the country through which it flowed was full of large swamps and huge mountains, covered with foliage to the summits, and that there was no population on the banks, only solitary huts of gin-sing seekers here and there, and hardly any of the soil cultivated; boats can navigate the river in summer, and in winter sledges are used on the frozen surface.

Configuration of the Country.—Judging from the character of the mountain-ranges and flow of the rivers, it appears that the country slopes from east to west, and from south to north—the course of the Soongari River marking its lowest point—from which the country again begins to ascend towards the north and west; so that Central Manchuria and Northern Manchuria is just one huge basin, corrugated by several mountain-ranges, with their respective streams,—the mouth of the basin lying towards the north-east.

Climate.—The extremes of climate are more marked than in Southern Manchuria, but by no means so excessive as to interfere with agriculture. The winter begins about the close of October, and ends at the commencement of March, and the other seasons are proportionately narrowed; but the shortness of the time is compensated as elsewhere by the rapidity of growth and maturity. In the absence of thermometrical observations I took a note of the state of agriculture as I passed through the various places, which will help to give some idea of the climate.

TABLE OF AGRICULTURAL OPERATIONS, &c., IN CENTRAL AND NORTHERN MANCHURIA.

	1868.	Spring-Wheat.	Millet.	Maize.	Potatoes.	Trees.		Dockwood.	Dandelion.	Wild Flowers.	Opium.	Indigo and Tobacco.	Hemp.
						Willow.	Elm and Birch.						
Pe-tu-na . .	May 12	Inches. 1½	Sowing . . .	Sowing .	Planting .	Catkins fallen Buds just bursting . . .		4 to 6 inches	In full blade and blossom	Wild tulip; grass good	Preparing ground	Preparing ground	Sowing.
A-she-hoh .	,, 16	2 & 2½	ditto . . .	ditto . .	ditto	Nearly full leaf	Nearly full leaf	In full blade	Grass good	Wild pinks	ditto .	ditto .	ditto.
N.E. of ditto .	,, 20	ditto	ditto . . .	ditto . .	ditto .	ditto . .	ditto .	ditto .	In blossom	Crowfoot, Butter-cups, &c,	Sowing	ditto .	ditto.
N. of Soongari	,, 21	1¼	ditto . . .	ditto . .	ditto .	Fully out .	Fully out .	ditto .	ditto	Many wild flowers out	Mass good	..	..
San-sing . .	..	..	ditto . . .	ditto . .	..	ditto .	Hawthorn in bud	Pear in blossom	ditto .	ditto .	ditto .	Grass good	..
N. of Soongari	,, 28	2¼	Just brairding	Just visible	..	ditto . .	ditto ¼ leaf	ditto .	ditto .	ditto .	ditto .	ditto .	Just visible.
A-she-hoh .	,, 30	4	Brairded . .	1¼ inch	Garlic, spinach, and onions in market	ditto .	ditto good leaf	ditto .	ditto .	ditto .	Grass good	ditto .	2 inches.
La-lin . . .	June 2	6	2½ inches . .	2½ inches .	..	Hoeing in fields . . .		ditto .	ditto .	..	Opium up	Brairded .	3 inches.
Kirin . . .	,, 5	Everything up; hoeing in all directions; elder-tree in blossom; hawthorn in blossom; Scotch thistle in blossom.											
S. of ditto. .	,, 8	Woods in full luxuriance; wild flowers—geranium, forget-me-not, pimpernel, flowering peppermint, nettles, ferns, &c.											
Siau-ku-shan .	,, 9	Fields luxuriant; hoeing; first wild rose to-day; pulse in a good bunch; millet 2 inches.											
Fa-tuh-ha-mun	,, 12	Hoeing; hills green to the summit; millet, ⅝ inch; wild roses in all directions; cotton, 2 inches.											

In the neighbourhood of the Soongari we found ice still hanging on edges of deep wells, and I wore my top-coat in the cart in the early part of the day. The table of annual temperature for the port of New-chwang, which I gave in a former page, will also help us in reference to Central Manchuria, for if allowance be made for diminution of mean temperature throughout the year, it will give a comparatively good idea of the distribution of heat and cold. There appears to be more regular and general distribution of rain here than in the Southern Province. When travelling in this quarter hardly a day passed without a shower or two, just like April showers at home, refreshing the earth, and succeeded by pleasant sunshine.

The Great Highways.—While treating of Southern Manchuria, I spoke of the highways which ran through this portion of the country, and thus I need say no more of the chief roads. I may only say that there are good roads from Kirin to Kwang-Chung-tze, from Kwan-chung-tsze to A-she-hoh, and from Pe-tu-na to A-she-hoh, as well as many minor roads intersecting the country, of the same character as those in the south. They are also provided with good inns. North of the Soongari we had to travel by fixed stages, owing to the paucity of population.

The General Aspect of the Country.—Travelling from Pe-tu-na eastward the country presents one huge level plain, only broken by very insignificant undulations. Considerable patches of this prairie are cultivated, especially in the vicinity of hamlets, but the rest is just a sea of tall grass, waving in the wind, with little brushwood and few trees.

But the monotony of the steppes is more than compensated by the variety, beauty, and often boldness of the mountain districts. Here you have everything that can lend a charm to the landscape—hills and valleys, woods and streams, in ever changing aspects. The luxuriance of the vegetation is remarkable. In Shantung, and on the Manchurian promontory, the tops of the hills are as bare as bald heads—the vegetation gradually increasing as you descend, like sprinklings on the cheeks; but in Central Manchuria the hills are as green as in Scotland, and in many places cultivated to their very summit. Moreover, far north towards San-sing we crossed over a high mountain ridge, with oaks, and elms, and willow trees of huge size; and having crossed the Soongari, about long. 128° 10′, and entered Northern Manchuria, our route lay along the plains, on the north side for about 100 miles. Here we could see the country in the south, and I confess it amazed me to find the hills on the banks of the river, and the high peaks stretching far behind, covered with trees of such a size and foliage—so profuse that I could compare it to nothing but those beautiful islands in the East Indian Archipelago, clothed from head to foot with luxuriant vegetation, only of a different character. Trying to account for it, the thought struck me that the severe frost for four and five months every year must freeze and retain the moisture in those hills, so that when the sun asserts its power, the trees are at once supplied with abundance of water.

At Shantung, and other places where there is comparatively little frost, the sun constantly beating upon the hills, evaporates all the moisture, precludes vegetable life, and so leaves their tops standing out against the sky, bleak and barren. Again, in some places the forests are impenetrable, and in other places, as, for instance, in the high road from Kirin to Ninguta, so dense, that the traveller goes for miles without even being able to see the sun. Swamps are also met with, often of considerable extent.

The Character of the Population.—The bulk of the people are Chinese. They are either immigrants or the descendants of immigrants from the northern provinces. They have settled along the lines of the great highways, and are found in hamlets, villages and towns of greater or lesser magnitude all along these routes. Fresh settlers increase their numbers year by year, and as the Government encourages them, by giving them land at nominal prices, they are creeping out on each side, gradually reclaiming the waste ground and forest land in their neighbourhood. But it will take long before any impression can be made on this vast country. These Chinese carry their industrial habits and local manners and customs with them, so that Manchuria is just China extended out. One differential feature strikes you; they are healthier and stronger than their countrymen in the south, the result not only of the climate, but also of the abundance, variety, and cheapness of food.

A good proportion of Mahommedans are found amongst them. These religionists keep themselves distinct from the Chinese. In every town of any importance they have their mosques, eating-houses, &c. Sometimes they live in a separate locality, and foster a strong clannish feeling. In some places they form a considerable percentage; as, for instance, in Kirin, where they have three mosques. They are well disposed towards foreigners, and show us every civility. They claim kindred with us; say they are from the west, worship the same God, and have the same characteristics as I have already described in papers on Shangtung and Shan-si. Foreign travellers would do well always to inquire for them, when they will get rooms much cleaner and food much more palatable than at heathen inns.

The Manchus.—The Manchus are in the minority; moreover, there is some difficulty in distinguishing between them and their invaders. Those of them who live in the Central Province have settled down to agriculture or other definite pursuits; and in dress, manners, customs, and language, follow the Chinese. Their features are very much alike—their frames a shade coarser and stronger. Sometimes their guttural language indicates their descent, but in general it is only by inquiry that you can learn to what people they belong. Their women have large feet; but this is not always a sign of Manchu origin, for many of the Celestials have sense enough, when removed from the restraints of fashion, to discard this atrocious custom. The Manchu language is not much cultivated. The boys first learn the Chinese characters, and read the Chinese classics; and then those, who from position or prospects deem it necessary, go to some of the Manchu schools in the district cities.

Of roving Manchus I met with none, and am inclined to think this nomadic propensity has entirely died out. I met several companies of Manchu soldiers returning from the wars. They belonged to Northern Manchuria, and were much less civilised in appearance. Still they appeared to belong to families who pursued agriculture, and I understood some of them to say they were returning to resume their work in the fields.

The Number of the Population.—Every man forms a different estimate of the number of the population, and it is somewhat difficult to arrive at a satisfactory conclusion. The districts along the great highways are populous enough, and a traveller is liable to be misled; but when you discover that beyond these there are very few inhabitants, you are guided in your calculations, and are forced to set down the population as not greater than, say, two or three millions.

Cities and Chief Towns.—Kirin is the capital of the [illegible]
It is most beautifully situated, more so than any [illegible]
visited in China. Jeh-hol has many points of [illegible]
Kalgan in several respects commands th [illegible]
Tsing-chau-foo, in Shantung, is [illegible] uresqu [illegible]
chang stands in a fine situatio [illegible] h the [illegible]
it on two sides, but Kirin fa [illegible]
foot of hills of varying si [illegible]
three-fourths of a circle ar [illegible]
is occupied by the Soong [illegible]
it, and then making i [illegible]
Opposite the city it is a [illegible]
there, it was as placi [illegible]
sky above, forming a [illegible]
fields beyond.

The city itself is not equal to the situation. Had Moukden such a position it would be a noble place; as it is, the streets are narrow and irregular; the shops low in roof, inferior in style, the best being but second and third rate in character.

The great street runs east and west, but not in a direct line, curving here and there. A portion of the south side of this street is built on wooden piles, stretching out over the side of the river, reminding one of southern cities. Another great street runs north and south, and there are a great many cross streets, branching off at irregular intervals. Though the shops are inferior, yet, when you pass through the archways which lead to the large warehouses, you find many of the squares very tastefully ornamented. In the place where we lived, one side was occupied with flower-pots, ranged in tiers, one above another, with flowers from the south, such as roses, geraniums, and a variety of flowering shrubs. In front of the main door were tanks with gold and silver fish; and a little further removed was a vine in tressels, just beginning to open its leaves. The walls are low and very inferior, the lower part being built of mud, while the upper portion, having a castellated top, is the only place where bricks are used. The gates were somewhat lofty, compared to the wall, and were striking enough at a distance, but were found to be only painted wood, and made for a show. Recently built, these walls and gates had a better appearance than they will present when they have lived through one or two seasons of bad weather.

One peculiarity deserves special notice; the streets were all paved with sawn wooden blocks, which cannot fail to make a strange impression on the traveller accustomed to the hard streets and dreadful jolting of other cities; the smooth way and the dull sound, as the carts pass over, make him feel in reality that he is in a different region from China Proper. The Chinese name for Kirin is Chwen-chang, or "the Naval Yard" *par excellence*, a large number of boats and small junks being built in this place for various uses on the Soongari, Nonni, Amoor, and other rivers in Central and Northern Manchuria.

A-she-hoh (also called in Manchu Alchuku).—The city next in importance to Kirin is A-she-hoh.—This city lies 30 miles south of the Soongari, and is situated on the slopes of a gentle descent, which leads to the river, from which it takes its name. It consists of one long street, about one and a half mile, with many branching lanes, there are a large number of shops, and a good deal of country business done there, but the shops are all third and fourth rate, and yet we found a great variety of porcelain and other ornamental things from the south exposed for sale, indicating comparative wealth. There are said to be

1800 families of Mahommedans in the neighbourhood. They have one mosque, which was burned down by rebels in 1866, because they sided with the people in defence of the place. The population of this city is about 30,000 or 40,000.

Pe-tu-na (*Sinicè* Sing-chung).—The third city is Pe-tu-na, called Sing-chung by the Chinese. It lies on the north-east bank of the Soongari, and is a city of good size. It consists of two large streets, which run north and south and east and west. The cross forms the chief market, and there is a good deal of business done. The shops are like those in A-she-hoh, and the place rather dirtier. There are a great many Mahommedans; they have a fine mosque, which we visited at daylight. The population of the place I should take to be 30,000 or so.

San-sing, the last town in Chinese territory, lies on the south bank of the Soongari, on the east bank of the Hurka, and the south-west bank of the Hung Ho, having water on three sides of it. It consists of one long street, about two-thirds of a mile, running east and west, and two shorter streets running north and south. The shops are fourth class. The trade chiefly country trade. Not a few are engaged in sending boats down the Soongari to the Amoor with provisions for the sparse settlers scattered there. Others barter with the Fish-skin Tartar tribes, who visit them periodically. There are sixty families of Mahommedans; they have a mosque, which has suffered from a recent flood, but is now under repair. They have also two good eating-houses.

La-lin is situated about 120 miles north of Kirin; it is a market-town of about 15,000 or 20,000 people. The walls, which are new, enclose a large space, but the buildings occupy less than one-half of the area.

Ninguta is about the size of La-lin, and is not of much commercial importance as yet. The small business which is carried on is transacted in the suburbs.

Besides these fine district cities, as they may be called, there are other towns of greater or lesser importance. Chief among them appears to be Shwang-chung-poo, about 45 miles west of A-she-hoh. It is walled round, and consists of two long streets, north and south, and east and west. They are about 5 li long, and full of large inns, and dirty beyond description.

Woo-la-kiai, or Ta-seng-oola, lies about 25 miles north of Kirin, and consists of one long street, and a few short ones running east and west. It has a few good shops, but the trade is of little importance. There are the ruins of a fine old city in the north.

Koo-yu-shu, somewhat about 80 miles north of Kirin, may also be referred to, but this is only a market-town.

The Fertility of the Soil.—The height and luxuriance of the tall grass in the prairie grounds in the north-east corner of the Province, speak volumes for the fertility of the soil in that quarter. While there it was just bursting into beauty, but independent witnesses in the extreme east, near Hun-chwen, and also in the west, assured me that the grass often reaches 3, 4, and 5 feet, and sometimes entirely overtops the traveller, leaving him, like the fabled mermaid in the depths of the ocean, to make his way among waving swathes.

The huge forest and meadow lands are different in character, but equally fertile. On one part we saw them making a deep cutting, with the view of repairing the road.

The soil was extremely rich, a magnificent fat loam, apparently formed of millenniums of leaves. After the trees and brushwood are removed, little trouble is needed to secure plentiful crops. I took some notes of the quantity produced, which I here subjoin; and readers must recollect that the implements of agriculture are of the rudest nature, and, as a rule, no manure is used. At the small farms in the midst of the Prairie-ground, the average yield was approximately thus:—

10 mow of land yielded 16 tan of small millet or kutsze.
10 " 12 " tall millet or kau-liang.
10 " 16 " Indian corn or maize.
10 " 10 " pulse.

Six mow is equal to one acre; and one tan is equal to 400 lbs.*

Food and Plants.—Pulse stands first in importance, not only in respect of its use as an article of food, but from its nature as an article of export. There are several varieties of large and small. The large comprises the yellow, the black, the yien-teu, or French-bean, and the blue; the small embraces several kinds of peas of various colours, as red, gray, and variegated.

The yellow bean is crushed into beancake and oil; the black is used for horses and mules; and the blue for food, and also for vermicelli; the French-beans are also used as food. The small kinds serve a variety of purposes, many are ground down for vermicelli. Pulse is grown in immense quantities wherever agriculture is pursued. They sow it in the beginning of May, and reap it in October. The straw forms good fodder for cattle.

Millet.—Next in importance stands millet. This grain is used for food and also for cattle. There are two species, the tall and the short; the tall comprises four kinds—the red, the white, the black, and the sweet. The red is that chiefly cultivated, and has large heavy clusters of grain; the white and black are chiefly prized for their stalks, which are used for roofing, making bridges, walls, and fuel, &c. The sweet, or sarghum, from which sugar can be produced, is not much cultivated in this quarter. The short-millet includes several varieties, the chief kind is called Kutze, one of the staples of food, like oatmeal in Scotland. It is used in a great variety of ways, and makes excellent pounded-cakes, &c. The seed is small like sago, only golden yellow in colour.

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* Since writing the above, I have found that the size of the mow differs in Manchuria, being larger, so that these figures can only be looked upon as approximations.

Indian corn is cultivated pretty extensively, and forms an article of food. When there is a surplus it is distilled into spirits, like the seeds of the tall-millet.

Wheat.—The wheat of this province is all sown in spring, is bearded, and not much valued by the people.

Barley.—This cereal is also found, though not in large quantities.

Potatoes are indigenous, but, though good, are not extensively used.

Opium.—This article demands more than a passing notice, not only from its bearing upon the moral welfare of the Chinese, but also upon the commercial interests of foreigners. A few years ago it was a stranger to this quarter of the world, but now is rising with great rapidity into ominous and terrible significance. We found the poppy under cultivation, not only in Eastern Mongolia, but also everywhere in that level portion of country which lies within the link of the Soongari, on past A-she-hoh, to long. 128°, lat. 46°, and down to within a few miles of Kirin. In some places it had been grown for several years, in others for only two or three, and in some just commencing. Natives told us that it was much more profitable than pulse or any grain, that the proportion was as 24 to 14; that 10 mow of land yielded, say, 14,000 to 15,000 cash, when sown with millet; it brought from 24,000 to 25,000 cash, when laid down for the poppy. They knew well that its cultivation was illegal, but said the mandarins winked at it, on the reception of a sum of money or a gift in kind.

There is thus great reason to fear that it will spread all over the country. The prices varied from 350 cash to 500 cash per oz.; but we were told in several separate places that it could be bought much cheaper in autumn when new,—that at that season it could be procured for 200 to 250 cash per oz. They said it was better, and not adulterated as the foreign opium which reached them. As might be expected, its effects upon the population were most melancholy. Farmers' sons, and the majority of the young men, in almost all grades, including waiters at inns, were addicted to it. We found people in all stages of use, some just beginning, some in full vigour of smoking, and others who had smoked to the point of repentance, but who now found its mastery and were its remorseful slaves. We were constantly asked about a means of cure; and in one case a man followed us almost in tears, clinging to the cart, and would not believe that we had no remedy. Sad and awful is the havoc this drug is making in China, and we have not seen the end of it, nor even its culminating point. The worst is coming. It is now produced in Sz'chuen, Shensi, Shansi, Mongolia, and Manchuria; the mandarins are corrupt, and, indeed, interested in its success. Every year more land is laid down, the vice is increasing, reaching the poorer classes and even women. The habit is, as a rule, incurable, when it has reached a certain point. Ninety in every hundred thus stand before us doomed men, the majority sure of death within twenty years. What a sight! like some dreadful tide of destruction slowly rising over the people.

Indigo.—Previous to the introduction of the poppy, indigo formed a very favourite and important item in the crop raised by the farmer. So far removed from markets, roads so bad, carriage so expensive, it presented an article which could be compressed into small bulk, and secure a large return either in money or goods. Hence it was greatly cultivated, and formed the chief article of export from certain distant quarters.

I have no reason to believe that its production has diminished since the poppy has afforded them a yet more profitable investment, and there are those who think that the latter will only add to their incomes, and enable them to purchase more foreign goods. Were opium a safe article this would hold good, but as it demoralizes the growers and those around them it cannot be a benefit. *Whatever injures a people must injure commerce in all its relations.*

Industrial Pursuits.—In addition to agriculture and trades bearing thereon, the only other pursuits we saw were crushing pulse and distilling. The latter was carried on sometimes in a very extensive way. Here and there we met huge distilleries, employing a great number of men, and each supporting a multitude of pigs. In this way they dispose of their surplus crops, and export the whisky to the south.

Probable Mineral Wealth.—It will be observed that the hills in this province run in the same direction, and exhibit the same outward characteristics as those in the Southern Provinces and Shantung. The probability, therefore, is that they contain the same minerals. No one has tested this experimentally, as the abundance of wood provides fuel on easy terms, while manufactured iron for agricultural purposes can be had at comparatively moderate rates; but various minerals have been discovered wherever people have been necessitated to seek for them. Coal has been found in two localities; on the banks of the Bureya River on the north, and all along the sea-coast on the east, to the north of Possiet. Gold is found in some of the rivers, and also on the sea-coast.

Precious stones, such as agates, cornelians, onyxes, and other varieties, are found on the east of the Usuri. Plenty of iron and coal is found in the hills adjoining the Southern Province, portions of the same range, so that everything points to the conclusion that the mineral ores are varied and rich.

The Fauna.—The fauna is sufficiently startling to those who have not previously inquired into the subject.

The true Bengal tiger abounds in the forest, and reigns dominant there. We were fortunate enough in not seeing any of them; but one day, being benighted in a forest, and having arrived at the inn about 11 o'clock at night, mine host told us that God's blessing had been on us, for a few days previously a young tiger had attacked a cart, and attempted to drag away one of the mules in broad daylight. Natives are often carried off by them, and it is reported that several Russians have in this way mysteriously disappeared.

It is of the same species as the Bengal tiger, and reaches a great size, averaging about 9½ feet to the root of the tail. The finely striped skins are highly prized, and judging from the immense number annually exposed for sale in the chief towns, there must be no lack of these brutes among the hills. They are found so far as 51° N., and often go as far as 53° in quest of food.

The black bear also infests these forests, and with the tiger is a great terror to the natives.

Panthers are also very common. The pole-cat and weasel are found in all quarters.

The fox is found everywhere; in more retired places wolves abound, and we had the pleasure of seeing one almost every other morning for a time. Wild boars are found in several places, and their flesh is highly esteemed.

On the north of the Soongari, near San-sing, at one of the places we visited, sables were found, and we had abundant proof of this as some of the common men had caps made of sable-skin. They described to us the habits of the animal and method of capture.

Deer are plentiful and of several kinds; such as the stag, the antelope, &c.

Ground-squirrels and tree-squirrels are common.

Rabbits and hares were also seen.

Bats of various wing are met with.

The hedgehog is also found here, as well as in Shan-tung. We have met it in both places, thus invalidating assertions which have been made that it did not exist in this quarter of the world.

Domestic Animals comprise the horse, mule, ass, ox, sheep, pig, dog, and cat. The horse is small and hardy; the mule, wonderful in its endurance, is a finer animal than those in Spain. The ass is like our own; the ox in general like Highland cattle, a larger kind is used in agriculture. Sheep have large heavy tails, and are dull beasts. The pig black, with long snout, is the very picture of ugliness; the common dog, in shape like our shepherd dogs, in barking demonstration terrible, in courage nil. The cat, like English cats.

Sheep are few, contrary to our expectations: indeed, on the north of the province, and beyond the Soongari, we did not meet one—pigs being more prolific, more easily fed, and better fitted for roughing it in the extremes of temperature.

Of Birds there is considerable variety. There are several species of eagles, not a few kinds of hawk, several varieties of owl. In less retired places are pheasants, red-legged partridges, quails, grouse, and a bird of the size and character of the turkey.

Small birds are very plentiful in the copses; and not a few singing-birds of familiar song, especially north of the Soongari, such as thrushes, finches (bullfinch among the rest), linnets, tits, hammers, and buntings.

Waterfowl of endless variety and countless numbers frequent the rivers and marshes, such as wild geese, ducks, teal, snipe, cormorants, heron, cranes, and gulls. North of the Soongari we met the lapwing, or pee-wit. Sitting in the cart we heard it cry; we jumped out, saw the bird alight, followed it, and then others rose and enacted in this strange land the scene so familiar on the moors of Ayrshire. They flew round overhead with their well-known sweep, crying, and, at once threatening and alluring, as in other lands. The cries of the curlew and the plover also broke the solitude, and aroused crowds of associations in our minds.

Ravens and jackdaws were common.

Swallows are everywhere, and the elegant "swift" was often seen circling round some pagoda or such eminence. The cuckoo was very common, one kind with a bushy-tail—which went like a wagtail—greatly interested us for several days. It was an extremely pretty bird, and its call was the first thing heard in the morning, and it continued throughout the whole day enlivening the scene.

The laughing-dove was also met with, and it was amusing to hear the bird running over its well-known formula of *Kwang Kwun haou Kwho*—"Solitary man, may you have a good journey," — as you went through the wood; so discordant with the other sounds, just like the laughter of a fool in an oratorio.

Fish.—Fish are plentiful in the rivers—such as trout, carp, perch, pike, eel, and salmon. This last is very important. The natives catch it in considerable quantities in season, and the tribes on the north of San-sing prepare the skins for making summer clothing, which, when properly manipulated and embroidered, look very pretty. We found some strange, fresh-water shell-fish—one a sprout-fish.

Reptiles, such as snakes, lizards, and adders, are common; frogs are ubiquitous, and insects of many kinds (1000 species the Russians say) hover in innumerable clouds, to the annoyance of man and beast.

The Flora greatly interested us, not from its gorgeousness, nor from its freshness, nor from its variety, but by the irresistible attraction of finding in this far distant country numerous home-plants in such home-like places. On the Prairie-grounds we found the grassy plain studded with innumerable dandelions, often grand in their size and beauty. At this early season, on the hill sides, we found the wild tulip in immense numbers in all directions. Amongst the woods we met the wild geranium, blue pimpernel, fox-glove, ferns, borage, &c.

In the valleys we found whole fields of cowslips, butter-cups, and the crow-foot's early bell. In the low grounds were crowds of sedges, the iris, generally blue, but sometimes yellow, &c.

Here and there we encountered varieties of the Scotch thistle, and several times, as on the banks of the Soongari, we met it growing in all its beauty—raising its head above all its compeers—like some Highland chieftain in full costume, plume and all, among the languid sons of China. Everywhere in hill and steppe, and wood and glen, we found the dockwood, soldier-grass, common thistle, and lots of familiar grasses.

In two places we met the nettle—first on the banks of the Soongari, close by a cottage; and next in the forest to the south of Kirin. The aborigines use it like hemp, to make ropes.

On our return journey the wild roses began to open; and soon we were regaled, day by day, with a profusion of rose-blossoms everywhere along the road-side.

Trees.—Like the flowers, the trees were more interesting, from their well-known features, than from any remarkable peculiarities; wherever we went we found five or six varieties of the willow-tree, two or three species of the oak, also the elm, birch, and maple.

The silver-birch, so well named, with its beautiful bark, often imparted a brilliance to the dark woods, like a well-arranged piece of colouring in a sombre picture, or a lightsome fairy among a common crowd.

One tree, unknown to Great Britain, but common to the north of China, abounded everywhere. I refer to the *Salix polaris*, a tree not unlike a poplar in appearance and size, and which is greatly esteemed by the natives.

We found the mistletoe in widely separated places,—at Moukden, at Kirin, also north of the Soongari.

NORTHERN MANCHURIA. — *Boundaries and Extent.* — This province, called Tsi-tsi-har, or more generally Hieh-loong-kiang, or "The Black Dragon River Province," by the Chinese, is bounded on the north by the Amoor, on the east and south by the Soongari, and on the west by the Nonni and Mongolia. Its area is 195,000 square miles. There appear to be only two cultivated regions in this province, viz., that in the valley of the Nonni, and along the banks of the Soongari. In the former we have the cities of Tsi-tsi-har (or Sinia-pu-kwhe) and Mergen; and in the latter the town of Hu-lan and several villages of greater or less importance. The other portions are in their natural wild condition.

We travelled about 90 or 100 miles in this district, on the north of the Soongari, and found villages few, far separate, people sparse, and only patches round their dwellings under cultivation.

The soil appeared excellent, only waiting the spade of the settler to yield an abundant harvest.

In some places prairie ground, dotted with herds of cattle carefully tended, extended as far as the eye could reach, and at other times mountains rose in succession far on towards the north.

The climate, fauna, flora, and general productions were the same, only allowance being made for their more northerly latitudes.

The Future of the Country.—Estimating Liau-tung approximately at 60,000 square miles, Kirin at 135,000, Tsi-tsi-har at 195,000 square miles, this gives you an area of 390,000 square miles, or 249,600,000 square acres. If you add to this the country of Eastern Mongolia, which lies in the same latitudes, you have a territory nearly equal to the half of China Proper, Possessed of a good climate, fertile soil, and mineral resources and good harbours—by far the greatest portion of it as yet hardly touched by man—who can doubt but that a great future lies before it? One thing is evident: it is clearly intended to receive and support the overflow of the Chinese population in the north of China for many years to come; and when it is properly opened up, and attention directed to its minerals, it must, together with Corea, rise into one of the most important districts in this quarter of the earth, and play an important part in the history of the world.

II.—*From Metemma to Damot, along the Western Shores of the Tana Sea.* By Henry Blanc, M.D., M.R.C.S.E., &c., Staff Assistant-Surgeon H.M. Bombay Medical Staff, lately on Special Duty in Abyssinia.

Read, December 14, 1868.

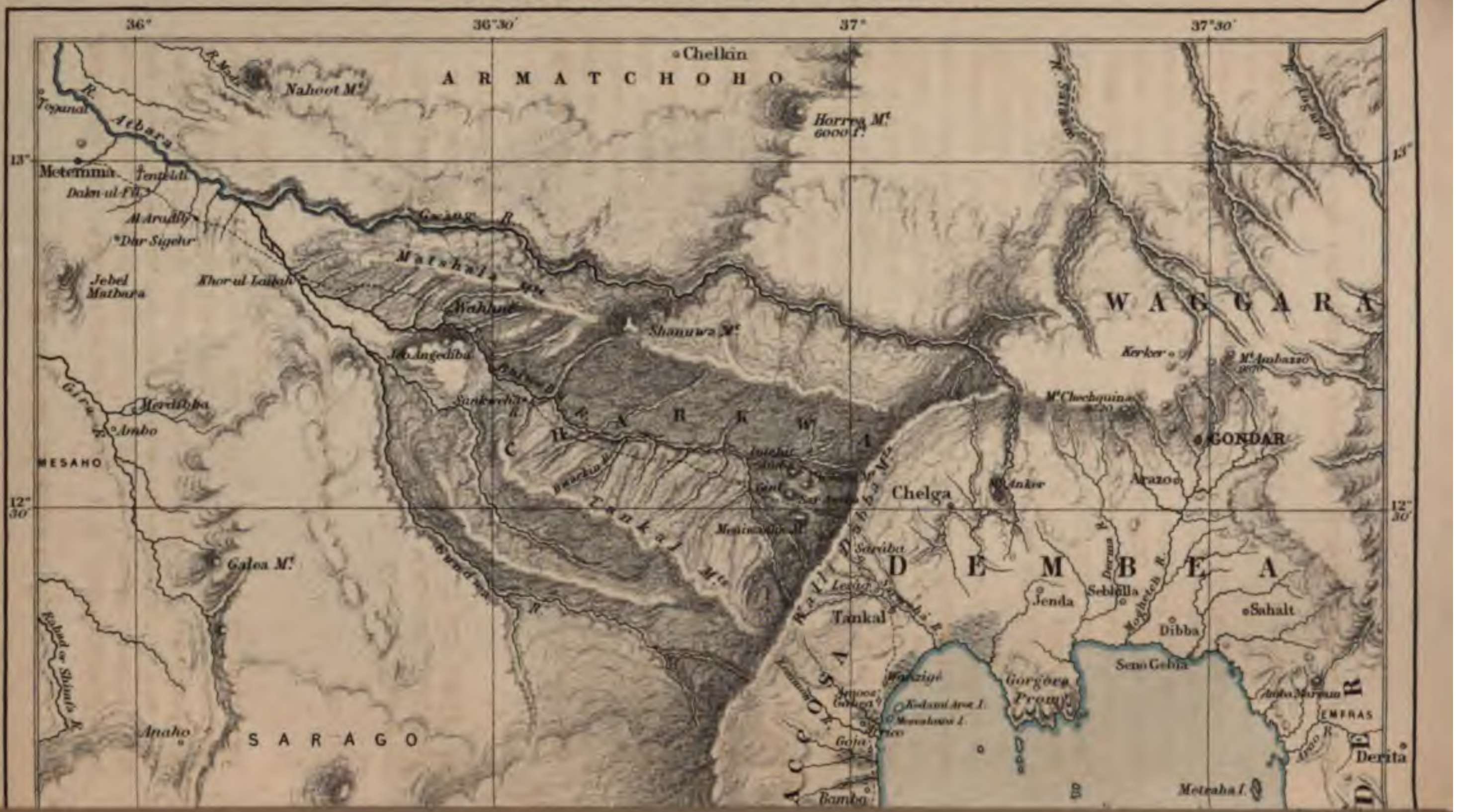
When, after thirteen months, Theodore at last acknowledged our mission and granted a surly reply to our third letter, he himself traced our route. He ordered us to proceed through the Soudan, and, arrived at Metemma—a Takruree settlement on the north-west frontier of Abyssinia—to communicate at once with him. We acted implicitly according to these instructions; and on the 28th of December, 1865, agreeably to his Majesty's latest commands, we passed the frontier, and proceeded, under escort, to repair to the Imperial camp, at the time in the province of Damot.

The distance from Metemma to Ashfa, the district where we met Theodore, is about 240 English miles; and to accomplish that journey we had to march through passes and defiles, follow the western shores of the Tana Sea, cross some of the finest provinces of Abyssinia, and ride over undulating plains graced by the presence of mighty herds of cattle, or walk single file amidst boundless cultivated fields.

Two years afterwards a gallant English army, landed by a Merewether and led by a Napier and a Staveley, marched from Zoula to Amba Magdala, a distance of some 320 miles, climbing mountains, descending wall-like precipices only to scale again more formidable ascents; struggling at every step with Nature in its most wonderful chaos, across a country badly watered, and where man labours hard to snatch from the soil a meagre harvest. Indeed, it required all the genius of the commander, all the sturdy courage and perseverance of the men, not to falter in the way and remain firm in the resolve "to set the captives free."

It is not my intention to speak of Eastern Abyssinia. At

MAP OF PART OF ABYSSINIA
TO ILLUSTRATE
Dr BLANC'S JOURNEY FROM METEMMA TO DAMOT



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the meeting of the British Association, some months ago, it was my good fortune to listen to a masterly summary of the labours of the very able geographer to the Expedition. My wish is to correct a false impression already too prevalent in England, and to discuss a conclusion too hastily assumed, reflecting, in my opinion, rather too unfavourably on the country at large, and too flattering still in its estimation of the inhabitants of the Abyssinian plateaux.

I have often, since my return to England, heard in the mouths of friends and strangers the short but graphic sentence, "Abyssinia is a wretched country." But I would venture to assert, did I not fear to be accused of jesting with mere words or of debating a foolish paradox, that the Abyssinian Expedition never entered Abyssinia at all.

The line of march necessity enforced upon our troops was the lofty irregular mountain-chain separating the sandy shores of the Red Sea from the plateaux, plains, and valleys of Abyssinia proper. A barren, desolate tract, the watershed of the Mareb, the Tacazzê, the Jitta, and the Bashelo, as different from the lands they beautify and enrich as the snow-capped peaks of the Swiss Alps, the cradle of many a mighty stream, are a dreary contrast to the rich and fertile regions watered by the Isel or the Rhone.

On the other hand, the inhabitants of the country with whom the English army came in contact on its ever-memorable march to Magdala are (apart from some of the people of Tigrê) the Shohos, the Azubos, and other Gallas, the degenerate Christian children of Wallo, and the mixed tribes of the Dalanta and Wadela plateaux.

I do not mean to infer that had the army selected another route, and passed through Dembea, Bagemder, Waggara, Metcha, or Damot, they would have been impressed with a less favourable opinion of the natives; on the contrary, I believe that the craftiness of the border tribes, and their gross, coarse immorality, would have been masked by the hypocritical plausible bearing none better than an Abyssinian can assume; and that one and all would have found but words of praise to extol the generous, kind-hearted Christians of Ethiopia. But if it was given to the Expedition to see only Abyssinia in its rude, desolate form, to admire the noble vista of a glorious alpine scenery, the unrivalled beauties of a wild, savage nature, they could but sigh, and turn away in sorrow before that ideal of a poet's and artist's land—but nothing more; and could, looking to the people around them, but forget their faults and pity and love them. The Shohos and the several Galla tribes, though somewhat unruly, were on their best behaviour: from Senafê to the Bashelo, Sir William Merewether, the gifted, talented political officer, readily won the confidence of the natives and smoothed all possible difficulties. The high-minded Commander-in-chief, the people's friend, waged war with none but the arch-traitor Theodore, and was justly beloved and respected by all; and last, but not least, Maria Theresa dollars worked marvels: Tigrinians, as well as Gallas, grasped eagerly at the prize. An invading army paying its way, instead of plundering alike friends and foes, was an enigma none could solve, but that all gladly accepted. And although their want of truth, their sensuality, their thieving propensities will ever remain as a bye-word in the English army, still, on the whole, the true character of the Abyssinian, in the eyes of those who took a part in the Abyssinian Expedition, remains for them as hidden as the lands bathed by the Tana Sea, as unfolded as the noble panorama of yonder rich, fertile country, even a Theodore could not utterly destroy.

I may, some day, I trust, give by the analysis of facts that have fallen under my personal observation, an account of the Abyssinian people, representing them in their manners and customs, shewing them to the world in their true light, with their qualities and their faults: the vivid recollection of one whose privilege it has unfortunately been to have lived in their midst, a flattered and envied guest—a disgraced and insulted prisoner!

After leaving Metemma, the first 30 miles retain still many of the features of the plain, mingled here and there with the first vestiges of the mountain-ranges, rising so bold and grand on the distant horizon; stunted acacias, our constant companions in the Soudan, cover here again every rising ground, forming small detached woods, graced by tall venerable tamarinds, or entangled with some thorny varieties of the leguminosæ. The ravines and small valleys, luxuriant with tropical vegetation, are but miniatures of the glorious valley of the Atbara. All these have their rivulets, and, like the mighty tributary of the Nile, are lined with trees, similar to the boulevards of a great city, and surrounded by unweeded gardens, so lovely in their savage beauty.

When we passed, the tall grass was just losing its green tinge for a paler hue; trampled and beaten down on the almost hidden path, it covered like a carpet the stony ground,—a welcome friend to our barefooted followers. Every tiny valley, every cool ravine, rejoices in its brook of limpid water, a crystal line playing in flowery beds, glittering in the sun like a silver toy, the home of a countless host of a gaudy-feathered tribe, now bathing, now fluttering and coquetting, or uttering shrill notes of joy as they gaze in wonder at their pretty image reflected in the clear gurgling water. Who will tell of the noble game, of the mighty fierce denizens of these valleys? The buffaloes' stampede is heard like a distant thunder; elephants were often our pioneers; the lion's roar echoes throughout the night; here a gazelle starts from under our feet, and there a boa has left his trail on the crushed grass. But day by day the scène changes; and as we approach Wahhnê, several hills, sentries of yonder blue mountains, lay in our route. The rounded hillocks give way to conical mountains or to small plateaux, diminutive models of the highland plains. Still the gum-trees, now and then the sycamore, further on the fir: but as we advance the whole country assumes a more barren aspect; the valleys are longer and wider, the stream deeper, more rapid, bounding, wearing away the earthy banks, and carrying to Egypt Abyssinia's valuable tribute. Each hill we cross has more and more the appearance of the temperate zone; and even the valleys, deep as they are—now several thousand feet above the Soudan plain—have lost much of the beautiful vegetation we so much admired, are stern, cold, and formal, nearly desolate, and, were it not for the bamboo forests, so stately, so erect, so lofty—giants laughing at us poor pigmies as we dodged through their thick, close lines—they would be as barren as the very hills themselves; volcanic rocks have now everywhere taken the place of alluvium, sandstone, or granite; columnar basalt shapes into ambas and forts the crest of many a mountain; our zigzag road is paved with dolomite, and pumice and conglomerate roll under our feet as we wade through the mountain torrent.

After leaving Sankwehâ, we cross the last small mountain-range that stood in our way, and from that elevation survey the whole space between us and the Abyssinian plateau. The mountain chain appears broken up, and the whole space dotted with closely packed isolated lofty peaks, separated by longitudinal valleys, all leading from one to another, and in the direction of the high land in front. At last we reach the foot of a towering perpendicular wall, some 2000 feet above our heads. The officers of our escort lead the way, and we follow, climbing the side of the precipice by a narrow, slippery footpath, at times so steep, so abrupt—enough to make the Alpine chamois giddy—that we shut our eyes, and dare not even cast a passing glance at the terrible yawning abyss below. Once fairly on the Abyssinian plateau, the traveller is amply rewarded for his pains; but what struck us, even more than the wonderful panorama displayed before our eyes, was the sudden and complete change in everything around us; and it seemed difficult to conceive that only a few thousand feet separate such opposite and different climes.

To us for so long denizens of the plains, the mountain breeze appeared delightfully fresh and cool, and our old enemy, the sun, we contemptuously allowed to play over our uncovered heads. The grass short and fine; nay, daisies and blue bells! Could this be Africa, or were we the playthings of fancy, the victims of delusion, and awake dreaming of home and country strolls? A roll on the flower-speckled grass, a long pull of the fresh breeze, that best of stimulants, and feeling strong and refreshed, we stroll about in search of the unknown. Here is a charming bower—a blending of the sweet-smelling jessamine, and of the wild white rose; there, behind yonder village, a dense grove full of cactuses, dark with cedars, inclosed by roses, jessamines, and sweetbriar. But this is forbidden ground; we can only admire this Eden from a distance, inhale the fragrant perfume of the sacred trees, and, like curious naughty children, peep through the entangled branches. No building, no temple, no altar appears in this, one of the Kamânt's sanctuaries; sons, it is said, of Israel's land, still worshipping their Father's God, Jehovah, though here they call him Kebir the Glory—still children of an idolatrous race; but wisely spurning Baal and Moloch, they bow down before Nature's noblest works—trees and flowers!

Taking advantage of a halt, I rode back about half a mile from our encamping-ground, to cast a parting look on the road we had followed.

Standing on the verge of the precipice, the natural imposing strength of that mighty barrier revealed itself in all its beauty; it seemed to me as if I were gazing from the walls of some mighty citadel, the work of those Titans against whom a Jove alone could war. Sâr-Amba, to my right, and almost on a level with the plateau, appeared like a huge bastion, the worthy advanced work of such a fort; before me, stretching far away in the distant horizon, a succession of mountains, hills, and hillocks, dwindling down to mere specks, until they disappear in the rosy mist of the low lands. Gazing on that admirable confusion from the heights of Walli Dabba, the hills and mountains we had climbed and climbed appear as mere children's toys, scattered over the plains—as mere mounds of earth raised by man at the foot of the gigantic wall.

The many streams we had passed were but few compared to the countless sources of the Atbara, spreading far and wide; many, as they glittered in the sun amidst dark ravines, could be seen slowly flowing towards the north. To the right and left, as far as the naked eye could reach, the same basaltic wall; and beneath, again, vales and rivers, mountains, hills, hillocks—as many stepping-stones for the Moslem of the plains to stride over to plant the crescent on the already tumbling cross, and crush in their foul embrace the last fading emblems of Africa's Christian faith.

A few miles from Walli Dabba, on our road to Kanohâ, the chief of our escort bids us himself abide awhile, and admire the gorgeous noble vista. Behind us a long blue line of mountains, running west to east, and towards their north-eastern extremity, under yonder almost hidden peak, a dimly-defined clump of trees marks the spot where Gondar then stood. From those mountains a green shelving plain, dotted with villages, and many ruins, watered by hundreds of rivulets, all flowing towards the south, stretches to the very margin of the lake, a fertile region—Dembea, Gondar's granary. To the left, more mountains, running north to south, seem to rise from the lake itself, towering higher and higher as they disappear towards the east; and, on a level with the loftiest peak, begins Abyssinia's noblest province, Bagemder, the land of sheep and corn. In front, the lake stretches far and wide, and beyond, toward the south, a dim outline—the bold towering Gojam range, but for us so faint, so pale, that were it not for a pure cloudless sky, we might have believed in some dark vapours playing with the genii of the Nile. To our right, extensive shelving, undulating plains, with now and then a dark peak on the distant horizon, some lonely amba in Theodore's native land, Kuara, or part of the range that bounds Atchefer towards the west.

Our route now leads us through a fine open country, up and down a succession of rounded hillocks, shelving towards the Tana Sea. No timber; hardly even a solitary tree; now and then a few thorny bushes; our favourites the wild rose and the jessamine; or a few kolquals in sheltered places. Altogether a wild looking savannah, replete with game—the home of herds of antelopes, staring vaguely as we pass along, and as yet untaught to see in every man an enemy, unmindful of our presence, resuming their interrupted meal.

Although the whole district from Walli Dabba to Kanohâ was little better than a wilderness, everywhere we perceived traces of recent prosperity. Ruins, dark, blackened ruins stare at us wherever we look; no cattle grazes on the fine delicate grass; no harvest rises in those fields, left to thorns and thistles. Taccosa was, as well as Dembea, a prosperous, populous, and fertile province—the happy home of thousands. Why such a waste? But let us pass on and be silent; let us pretend ignorance of the past; our guard's eyes are upon us, and this is Theodore's work!

To Goja the descent is gradual but constant; and that village, quite on a level with the lake itself, cannot be less than a thousand feet lower than the plateau of Walli Dabba. From that spot, Goja, the lake is not unlike a huge picture; green shelving shores, and blue distant highlands, are the frames worthy of such a gem.

From Goja to Belass we cross the same undulating plains; but near the lake itself, the ground is frequently marshy, and the many small creeks appear from a distance like green waving fields, so dense are the bulrushes.

Here we meet for the first time, since nearing the lake, with the fig-bearing sycamore; and at Amoos Gabea (the market of Thursday), with some fine specimens of the chuba, a laurineous tree under whose wide-spreading branches the villagers, from many a mile around, held in former days a weekly well-supplied market.

From Belass the ground insensibly but gradually shelves upwards towards the south and west. Villages now and then begin to appear, scattered, dispersed, and far apart, mingled with ruins—the same black ruin, the work of fire lighted by a pitiless hand, casting a gloom on the few standing hamlets a passing fancy allowed to remain. For the first time since leaving Walli Dabba, we see a few hungry-looking peasants, ploughing long stony fields, and urging their emaciated-looking bullocks, with shouts and cruel blows from the long hippopotamus whip, into a slow monotonous step.

As we advance, we leave the lake to our left. The undulating plain here gives way to more decided rounded mounds, separated now and then by miniature valleys, each with its clear running stream gurgling as it flows towards the Blue Nile's lake.

Volcanic rock is, up to Kanohâ, the general geological formation; a dark soil, the detritus of these rocks, covers to a depth of several feet the shelving plain we crossed, forming at some places on the shore of the lake itself a succession of earthy waves, shaped into tumuli by the tropical rains.

As I have already stated, when we passed through Taccosa, that province appeared as bleak and desolate as any wilderness could be; but such is the astonishing fertility of the soil, that although only a small proportion of the inhabitants, "on their pardon being proclaimed," found courage enough to return to their burnt-down villages, and till the ground the best way they could, Theodore some eighteen months afterwards again quarrelled with them, plundered and fed for several weeks his army and followers on what had seemed to us a sterile barren tract.

The provinces of Wandigê and Atchefer had not been plundered this time, and on a former expedition only partially so; some of the cattle had been left to the peasants; the villages had not been burnt, nor the churches destroyed; and though they had not entirely escaped, like the more fortunate Agau Meder, a year had been more than sufficient to hide at least the traces of the tyrant's passage.

From Kanohâ to Ashfa (frontier of Damot), it is impossible to conceive a more lovely country, to dream of a more beautiful, fertile region, slightly hilly; the prospect is even more pleasing than the green plains watered by the Tana Sea.

The province of Wandigê, with its long, rolling, undulating ground, is something, I fancy, very much like the American prairie, studded here and there with isolated conical peaks, of an average height of 800 to 1000 feet. Mountain ranges appear to the west and south, the watershed of the Blue Nile; and by a gradual ascent, our route takes us across some small mountains, the foremost hills of the Gojam chain. Villages crown almost every mound, where the tall cedars, the sycamore, the gêshu, and wild coffee-tree point out the secluded spot, above which arises, half-hidden by the dense foliage, the modest Coptic cross.

Thousands of cattle graze over almost boundless natural meadows, watered by countless streams, and only checked in their vastness by endless cultivated fields, where in the same vista can be seen the peasant ploughing, the green sprouting corn, and the ripened harvest ready for the sickle.

We cross the Kiltee and enter the land of the Agaus; one tribe, it is said, originally with the Agaus of Lasta. Did they at one time possess themselves of Central Abyssinia, and limit their conquest by the Lasta Mountains and the Gojam chain? Were they, as some assert, the Autochthons, inhabitants of the land, driven and scattered east and west by the Amhara? No record of the past, no deed of the present day can bear out that theory. Not they, the brave hardy mountaineers of Lasta; the bold horsemen of Agau Meder; never has Amhara lance driven out of their father's land the gallant Agaus. They are conquerors, not a conquered race! Like other Galla hordes, they came some day from Central Africa: one section of the tribe settled on the lovely plateaux, watered by countless streams—a land of milk and honey; others of a more adventurous spirit pushed further on, and took possession of a mountainous district, better fitted for a war-loving clan. I like the Agaus; I like their fair handsome faces, their long silky hair, their well-knit forms, their daring, their courage, and, above all, feel grateful for their kind genial welcome, such as only a brave race can give!

Agau Meder—more favoured by nature, more prosperous even than Wandigê and Atchefer, a land of horse as well as cattle—was also more fortunate, and never fell under Theodore's dis-pleasure. He was too cunning to attempt to plunder a land protected by such a valiant race. Here we saw the Galla cows, with their immense long horns, some 4 feet long, gracefully worn by small, short, well-knitted cattle. Here also we met with the wild peaches, sweet lime, and the beautiful kosso-tree, a noble, gracefully stately bunch of flowers, pink rose or yellowish white, dropping like golden grapes, a priceless remedy under a lovely form.

Onward we march, and the same fertility prevails everywhere, but the aspect of the country somewhat changes—more hilly, more wooded; we pass by Zugda, Karkatcha, Gardomite, Kauka—small towns rather than villages; churches and market-places, those signs of trade and piety, are nowhere more numerous. Nevertheless the Agaus are considered a rude and unchristian race. Churches may arise around their villages, but still at heart they are pagans, says the Amhara. For me who only saw them good, kind, and hospitable—whatever heresy may be grafted on their faith—I believe that they are truer followers of Him who loved such as them, than the vain-glorious, bigoted, self-worshipping Abyssinian.

We pass Korkuera and the River Terinka, flowing towards the Blue Nile. More villages, more cultivated fields, more flowery prairies, rich in horse and cattle. We cross the Kuashim and the Gamassu again to wind through rivers. Skirting hills on our left, we pass at the foot of the small picturesque amba of Zirihi; and leaving the hilly plain, now wind our way through wooded valleys, and ascend the white sandstone Mount of Injábara.

On the banks of the Messinie with regret we bid good-bye to our Agau friends, and pass into Damot.

Damot, the rich, the wealthy, the diamond amongst so many gems, why has prosperity departed from thy faithful sons? Why does desolation reign in abundant realms? Why? Ask Theodore. Only a few days before our arrival, the dark horsemen, the locust-like spearmen, have been told to kill and destroy, to plunder and burn. The blackened soil, the silent ruins, the ravaged fields, everywhere proclaim that the merciless order has been but too faithfully obeyed. But what dark crime, what perfidious deed warranted such a sentence? Did they rebel against the King of kings, smite his governors, fly from his presence, and curse his approach? No! brave men of Damot, you served him well and truly; but Theodore, once brave, is himself conquered by his evil passions. Tadla Gwalu, his mortal foe, guards the passes leading into Gojam. With his discontented, wavering host, Theodore fears to venture on an attack, and he destroys you out of friendship. He says so, that on his departure you should not have to bear the rebel's yoke.

Another day's march, and we reach our journey's end. We approach the Imperial camp, so well hidden in valleys and woods from the gaze of all, that, were it not for the smoke arising from miles around yonder hill, graced by the white, red, and black tents of Theodore, we might have believed that the bold spirit of that strange man dwelt alone in that plundered, desolate region.

After a day's halt in the Emperor's camp, Theodore sends us word that on the morrow we will march with him. The army cries for bread, he says, and the bad peasants refuse to bring in any more supplies. Why not have spoken the truth, and said "The enemy protects their fields; to feed my army I must plunder the few districts faithful to me"?

Theodore's mode of travelling can be well understood by a glance at the map: sudden movements, cross-marches; one day marching towards the rising sun, the next day back again, and then turning to the north or west.

At the eastern extremity of a valley, on an average about a mile in width, separating Damot from Metcha, we crossed the Blue Nile. At that spot the river flows between well-wooded banks, some 10 feet high and about 30 feet in width; the stream is on an average from 2 to 3 feet in depth, the current moderate, and the bed stony.

We parted from Theodore at Fagitta, on the border of Agau Meder, and passed again through the same fertile region we had crossed a few days before, this time some miles to the eastward. Here again we met with a succession of small running streams, all flowing eastward towards the Nile. After a few days we once more followed our former route, and from Zugda back to the lake halted generally on the very same ground we had selected on a previous occasion.

We were bound for Kuarata, the principal commercial city on the eastern shore of the Tana Sea, almost opposite Kanohâ. Theodore had intimated the desire (his slightest wishes were ever for us formal orders) that we should abide at Kuarata until Consul Cameron and his party should have joined us. He advised us to cross the lake in native canoes, sending our horses and mules by land to Kuarata.

We did not tarry this time at Kanohâ, but pushed on at once for the lake, some 4 miles due east from that place, and encamped near a small Waito village on the very beach itself.

A few days were required to bring from Kuarata, Dek, and other ports, the several hundred bulrush canoes we required; and as the whole Imperial fleet at the time in existence was not deemed sufficient to convey our large party, the Waitos were ordered at once to collect bulrushes and build a few dozen of these pretty but rather frail skiffs.

The poor Waitos at first sight are not very prepossessing, and to their uncouth appearance, as well as to their indulgence in the reputed unclean flesh of the hippopotamus, are they indebted for the kind of odium in which they are held. Supposed to be in league with boudas, ginns, and other evil spirits —a slur not to be despised in a land where to be feared is better than to be respected—they are generally left alone.

The Waitos rejoiced at the sight of our rifles, and were the first to propose to lead us against the huge quadruped, their foe and favourite food. Accustomed to attack the hippopotamus with their short spears, a chase full of dangers and perils, expert fishermen, the only sailors of that inland sea, bred to hardships and fierce struggles, they are brave and speak lightly of the fearful wounds but too often their share in the life and death strife between them and the infuriated monster. Many succumb in the exciting contest, whilst some, more fortunate, live to boast of their hard-won scars.

We did not join the Abyssinians in their odium against these poor people. On the contrary, finding them civil and obliging, we treated them with kindness, gave them unasked many a trifle, and saw with pleasure that they deeply felt our considerate manner, and knew, when treated as fellow-men, to behave as such.

On the 13th of February we were paddled over to the island of Dek, and to stimulate our splashers (I cannot call them rowers) we offered a prize for the three first arrivals. At starting the novelty of the idea and the hope of enriching themselves produced a considerable excitement amongst the Waitos; but after a while, when it appeared from the lead some of the canoes had gained that the race was over, the natural apathy of all Africans overcoming their excited passions made them turn a deaf ear to all appeals, and nothing we could say could induce them to try to redeem the day's fortune; the foremost, as well as last, resuming their ordinary snail pace.

Dek is a cluster of several islands. The two largest, separated by a narrow and deep channel, appear, except on near approach, to form only one, about 7 miles in length to a couple in breadth. Around them are grouped several of a smaller size; one of them, visible from a great distance, is merely a mountain-peak arising abruptly from the water.

The larger islands are inhabited, contain several large villages and four churches, all of great sanctity. Large and small are all well wooded; and no prettier spot, no more fairy-like islands, could be imagined than those of Dek. They give to the scenery a charm even the Leman, with all its beauties, cannot rival. Nothing can be more graceful, on near approach, than their dark basaltic walls, a few feet above the water, covered with a splendid luxuriant vegetation, gracefully bending over the sides and reflecting their charming shadows in the deep-blue waters of the lake.

The following morning we started for Kuarata, and we arrived within stone-throw of that city, so well concealed by the wide-spreading sycamores and lofty cedars before we had even suspected its proximity.

Kuarata is a very ancient city. King Claudius's queen built and endowed a church on that small headland; and, as Abyssinia was at all times a land of strife and warfare, merchants eagerly sought the protection of such a sacred asylum, and soon an important commercial city arose at the foot of the Church of Kedûs-Georgis. Many of the houses are built of stone and mud, and those of the principal merchants boast of wooden doors, square rooms, and ornamental ceilings. Some of the best houses were placed at our disposal; but we were too fond of cleanliness, fresh air, and abundance of water, not to avail ourselves of the proximity of the lake.

Kuarata is built on the side of a rising ground, a small basaltic hill, bathed at its feet by the waters of the lake; and from the sacred eminence a succession of mountains and plateaux lead to the high range forming the western boundary of Bagemder. South of Kuarata, the land is for miles low, somewhat marshy, stretching in the direction of the Nile, intersected here and there by small basaltic promontories, and crossed by a river some 10 feet wide, on an average from 5 to 10 feet deep, flowing from the eastward towards the lake in such a calm, torpid manner that at first sight I was inclined to believe that canals had been introduced into Abyssinia.

Our two trips to Zagê are sufficiently well known to allow me to pass them over in silence.

Zagê is a long promontory, about 600 feet above the level of the lake, and connected with the mainland by a small, narrow strip of land, a few feet only above the lake, and surrounded by flat, marshy ground, the home of thousands of hippopotami. From the church, standing as it does on the very extremity of the promontory and built on the highest peak, the view is, indeed, splendid. On a clear day almost all the lake is visible. To the westward we have Wandigê, and the Blue Nile winding its way through Metcha, the guardian genius of those endless meadows; at the south-east extremity of the lake some lowland, and again the Nile, now strong, bearing away the waters of its great lake, soon to disappear behind the high Gojam range. To the north, the island of Dek, appearing from the peak of Zagê so near, so distinct, as almost to tempt the bewitched admirer into a mad, giddy leap. Further on, Kuarata and the island of Metraha; and though occasionally we had a glimpse of the highlands near Gorgora, we could never follow the outline of the lake between Kuarata and the eastern extremity of the Waggara range. The lake, no doubt, makes there a great bend towards the east, and moreover, from what I have been told, the shores in that direction are low and marshy.

Turning towards the south, we follow the long, even plains of Metcha, stretching to the foot of the first mountain-range in the province of Damot, the blue mountains receding, like an amphitheatre, towards the south, until they disappear, only to leave a few elevated peaks, landmarks of the Valley of the Nile and of the present limits between Abyssinia and the several Galla tribes.

Of all the towns on the shores of the Tana Sea, if not on a par, at least next to Kuarata, came, for prosperity, wealth, and importance, the garden town of Zagê. Many had been the palmy days of that thriving important mart, the great depôt of the various products of Metcha, Damot, Agau Meder, and Gojam. Nor was it simply a dreary, bustling metropolis. Nature herself had not been idle: coffee-trees, gêshu, cedars, and sycamores transformed into one immense garden the sloping mountain, and adorned alike the peasant's abode, the market-place, and the precincts of the holy church.

We were unfortunate again on this occasion, and visited Zagê some weeks too late. Trampled, broken down, half torn-up trees alone proclaimed the past pleasing aspect of the place; and all that we saw of the remains of a city of at least 5000 inhabitants were round hard patches, cold-looking blotches on the greensward, the only standing record of the houses that sheltered the children of the land; homes wantonly pulled down to build a palace for a tyrant, where he might, in regal dignity, receive and treacherously arrest his English guests, leaving the poor, stripped, plundered natives to wander in the marshes of Metcha, yet happy to die of want and misery rather than fall under the pitiless hand of their heartless ruler.

Except towards its north-east extremity, we have been able to arrive at a very accurate knowledge of the Tana Sea. We saw it, in its general outline, first from the heights of Walli Dabba; secondly, from the promontory of Zagê; we followed it along the western shores from Tankal to Kanobâ, and crossed it, in native canoes, from Wandigê to Dek and Kuarata, and several times between that city and Zagê. Theodore had, for once, told us the truth, when, on leaving him in Agau Meder, he, said, "I send you to Kuarata, as I know from Plowden that Englishmen like our lake." He was right: we enjoyed the lake immensely; we loved its clear, fresh water, its calm stillness, the blue mountains and dark islands reflected in its unruffled surface. We were never tired of gazing on the plying canoes; on the grotesque frolics of the snorting hippopotami; at the long files of laughing maidens, winding their way along the beach, bending under the weight of large water-jars; the very bulrushes themselves had their charms! Without the lake the few, very few, happy days we spent in Abyssinia would not live in our memory, a pleasing contrast to our many misfortunes. We had been wise in leaving the sacred city for the fresh breezes of the lake. Our tents were pitched so near the water that the playful tiny waves tried to wet us with their spray. A step, and a cool refreshing bath awaited us,—a luxury prejudice denies to the bigoted Amhara. If fond of sports, we seize the gun and sit on the nearest rock. The many water-fowl, the geese, the ducks, are all so tame that we need not stir; they will come to us, and almost seem to say, "We are here; pray, shoot us!" And for those who prefer the fishing-rod, they have fish so plentiful, so delicate, that we could well understand the priests' long fasts.

Geologically speaking, the lake can be compared to a huge crater. The shores, the islands, the surrounding mountains all are volcanic, basalt being the prominent feature. The shores are formed by a succession of small bays, separated by projecting headlands. The generality of these creeks are more or less marshy, green with immense fields of reeds, spreading out at places to such an extent that it is difficult to ascertain where the water ends and the land begins. The projecting headlands, —be they promontories like Zagê or Gorgora, or small and nameless—are all fashioned after one pattern; basaltic rocks arise abruptly from the deep waters at places so profound as to be entirely free from the breeze-loving bulrushes.

Such is, in its general outline, the Tana Sea and the several provinces of Western Abyssinia we passed through. The climate, on the whole, is good; in the valley of the lake itself some parts are feverish and unhealthy. The heat also, in the middle of the day, is not sufficiently tempered by the cool mountain breezes; but some miles from the lake, or a few hundred feet above its level, even the plateau of Chelga, the high plains of Atchefer and Agau, with all their many advantages, cannot, in that respect, claim any superiority. All are alike cool, pleasant, and healthy. Western Abyssinia is within the range of the tropical rains: there much earlier, longer, and more important than in

Eastern and Northern Abyssinia. The whole—be it valleys, plains, or plateaux—is watered by countless streams; the soil, the detritus of volcanic rocks, is so rich, of such fertility, and enjoying as it does so many climatic advantages, we cannot be surprised if three harvests are usually reaped in a year. Teff, the staple food of the country, grows almost everywhere, except on the higher plateaux, where corn and barley thrive so well. Cotton covers the plains of Foggara; wine is made from the grapes of Mahdera Mariam; honey, fragrant from the sweet perfume of wild flowers, is ludicrously abundant; and the herds of cattle, in peaceful times, of such magnitude, in numbers hardly to be credited, enough to supply a thousand cities! Western Abyssinia, well may we exclaim, is indeed a land of milk and honey: a "land blessed by God, but cursed by man!"

III.—*Journey in the Caucasus, and Ascent of Kasbek and Elbruz.*

By DOUGLAS W. FRESHFIELD.

Read January 11th, 1869.

WE left London on the 4th of January, last year, but it was not until the 26th of June that we were ready to start from Tiflis for the Caucasus. The intervening months had been spent in Egypt and Syria (where we were lucky in accomplishing a most interesting journey from Jerusalem to Damascus, *viâ* Jerash, Bozrah, and the so-called Giant Cities of Bashan), and in an expedition down to Tabriz combined with an attempt on Ararat, which was frustrated by the unusual inclemency of the season. From Erivan we returned to Tiflis by a little-known road, past Djelaloghu and Schulaweri, which, after skirting the base of Alaghos, crosses three mountain chains at an elevation of 7000 feet, and leads through some of the most exquisite woodland scenery in Georgia.

Our party had been of varying numbers, as long as we were on the high road of Eastern travel, but on leaving Constantinople my friend Tucker and I were thrown on our own resources, and the assistance of our trusty attendant François Devouassoud of Chamounix, who had been with us as a travelling servant from the outset. At Trebizonde we engaged, to act as interpreter, Bakwa Pipia, a Mingrelian by birth, who was generally called Paul, and had learnt French and cookery in European service. The main object of our visit to the Caucasian provinces was to explore the great mountain chain, and to ascend, if possible, some of its loftiest summits. I had spent many summers among the Alps, and often wished to visit some other first-class mountains, to see how far the features of the scenery would resemble those with which I was familiar. When time and opportunity allowed me to carry out this scheme by a journey in the Caucasus, I was fortunate in finding a second comrade in Mr. Moore, who, unable to leave England in the winter, agreed to join us in June at Tiflis.

At Tiflis we received what help the Russian authorities could give towards an expedition the object of which was entirely novel to them. We have especially to thank, for much courtesy, General Chodzko, under whose superintendence the 5-verst Ordnance map was executed. This map, though by no means perfect, is, when the time and means at the disposal of its makers are considered, a very creditable production; it is particularly accurate in the distinction of the wooded and treeless districts. From it, a very careful relief model of the Caucasus, on a large scale, has been executed, of which a copy has recently been presented by the Czar to the Geographical Society of St. Petersburg. From Mons. Abich and Herr Radde we received some valuable hints, and the latter kindly, presented us with copies of his recent work, 'Die drei Hochthalern Imeritiens; Rion, Ingur und Tschenis Squali.'

The new Dariel road is now nearly completed, and is well made, although not equal in point of engineering to the best Swiss or Austrian highways through the Alps. On the south side the scenery is pretty, without being grand, and recalls parts of the German Tyrol. The valley of the Terek, on the north side of the pass, is of an entirely different character; treeless glens, bold rocks, slopes of steepness forbidding even to eyes accustomed to those of the Alps, and stone-built villages scarcely distinguishable from the neighbouring crags, but for the one or two towers of defence which rise above the surrounding hovels, form the main features of the 16 versts' drive from Kobi, the highest station in the valley of the Terek to the village of Kasbek. The observant mountaineer will previously have caught several glimpses of the summit of Mount Kasbek; but it is only on reaching the station that the magnificent mass is fully seen, towering thousands of feet above all its neighbours in the form of a steep-sided dome of snow, broken by masses of crag, the uppermost of which, a horse-shoe in form, is conspicuous in most views of the mountain from the east.

The weather was fine and promised to last. Anxious to profit by it we engaged a villager, said to know the mountains, to accompany us, and climbed to an old church perched on a lofty brow 1500 feet above the village. Thence we walked on to a summit about 10,500 feet in height. Our way to it led up a grassy ridge adorned with a rhododendron with large white flowers, several kinds of gentian, and many other plants which lack of botanical skill prevents my naming. Kasbek was now directly opposite to us; a long glacier streaming round its south flank, and ending at our feet. From this point of view we saw the second or west summit, which is quite invisible from the station, but here appears equal in height to the eastern. This was a source of perplexity. I had throughout a strong belief that the eastern was the highest peak, but opinions were divided; one thing, however, was clear,—that from the glacier on the south flank of the mountain a series of crevasse-broken but easily surmounted slopes offered a way to a height of at least 15,000 feet, and that the gap between the two peaks could not exceed 16,000 feet in height. It seemed to us worth while to attempt to reach the gap by this route, and we determined to do so.

I may now, with the great mountain full in view, briefly advert to the position it holds amongst Caucasian summits, and to the legends connected with it.

From the earliest times Kasbek has taken a place in history, and has somewhat unfairly robbed its true sovereign Elbruz of public attention. Situated beside, and almost overhanging the glen through which for centuries the great road from Europe into Asia has passed, it forces itself on the notice of every passer-by. The traveller, who, if blessed by a clear day, sees Elbruz only as a huge white cloud on the southern horizon, as he jolts over the weary Steppe, is forced to pass almost within reach of the avalanches that fall from his more obtrusive rival. It is therefore not difficult to see why Kasbek has become famous; why in early times, the mass of crag, so conspicuous from the post-station, on the face of the mountain, was made the scene of Prometheus' torment; why later superstition declares that amongst those rocks a rope, visible only to the elect, gives access to a holy grot in which are preserved the tent of Abraham, the cradle of Christ, and other sacred relics. We were told by Mons. Khatissian (an Armenian gentleman, who has spent many months in the vicinity of the mountain) that the Ossetes occasionally call Kasbek Beitlam and Christ's Mountain; names which seem connected with this tradition. There is no doubt of the superstitious reverence in which the high places round the actual peak are held by the neighbouring population. The name by which it is now known, and which has been apparently accepted by geographers, to the exclusion of several more or less unpronounceable native names, is like Elbruz of purely Russian origin. A certain Prince Kasibeg, or Kasbek, who lived in the village of St. Stephen (the present Kasbek) was one of the first mountaineers to perceive that his best policy was to recognise an accomplished fact, and acquiesce in Russian supremacy. He received his reward; the conquerors have given him immortality by conferring his name on the village in which he lived, and on the mountain which immediately overhangs it.

Even from the Russians, who, as a race, have no feeling for mountains (and regard them more as endurable eccentricities, than admirable beauties of nature), Kasbek has, during the last twenty years, attracted a great deal of attention.

Masses of ice falling from the great glacier of Devdorak, on the north-east side of the mountain, have blocked the stream in the glen beneath, and caused calamities similar to that in the Val de Bagnes. On our arrival in the Caucasian provinces we were told "Oh! you are just in time to see the great avalanche from Kasbek!" Enquiry showed that, a few years since, the Dariel road was swept away, and that a similar calamity was thought imminent during the coming summer. Everyone in Tiflis was talking about it, but happily the event never came off.

Several attempts have been made by Russian officers to reach the top of Kasbek, but with very little success, owing to the exaggerated fears of their native guides, and their own lack of proper mountaineering gear (rope, ice-axes, spectacles, &c.). Hence we found in the Caucasus a wide-spread belief in the inaccessibility of the peak, and the Tiflisers looked upon us with a mixture of amusement and pity as "the Englishmen who were going to try to get up Kasbek."

On our return to the post-house we were delighted to find that the Governor of Tiflis (whose acquaintance we had already had the pleasure of making) had arrived, accompanied by the Commandant of Duschet. They had come thus far to welcome the Grand Dukes Alexis and Michel, who were on a tour through the Caucasian provinces; and now, entering heartily into our plans, they rendered us all the aid in their power in making our arrangements.

The most experienced mountaineers of the village were at once summoned; to wit, three aged men, all more or less lame or blind, who in the way they nodded their heads together, and by their occasional outbursts of eloquence, reminded us forcibly of the old men's chorus in 'Faust.' We settled with them to take four men as porters at 2½ roubles (7*s.*) each a day; they were to follow where we led, and to pitch our little tent where we directed. I must do them the justice to say that they carried out their part of the bargain with an honesty and good humour which led us to form an unluckily premature estimate of the general character of the people with whom we should have to deal.

In the evening we witnessed a picturesque sword-dance performed by some mountaineers in chain-armour, who had come down from a neighbouring village to greet the Grand Dukes.

KASBEK.

On Tuesday morning (30th June) we started with a parting benediction from the two Governors. Leaving the church-crowned hill to the left, we went up the glen, passed over rough ground beside the torrent, and followed a fair track to a projecting bluff. A long and steep ascent, beguiled by the variety and beauty of the flowers, brought us close to the snout of the glacier, which (as I have said before) sweeps round the south flank of Kasbek, and, despite many remonstrances from the porters (who were already getting beyond their beat), we climbed on up the slopes on its true left bank, until at a height of 11,100 feet we found a most suitable spot for a bivouac. It was a mossy plot in a hollow, sheltered on one side by the moraine, on the other by a rocky spur of Kasbek. Here we pitched our tent, and passed a very fair night.

The weather, after sundry fluctuations, settled fine; and, at 2·45 A.M. on the morning of the 1st of July, we, that is Moore Tucker, and I, with François, set off on our adventure.

Before leaving the tent we, by pre-arrangement, fired off a pistol to give notice to the porters, who had retired to lairs at some little distance, and out of sight. No one answered the summons, and we set out unattended, carrying only our rope and sufficient provision for the day. The morning was calm and lovely; we fully enjoyed the moonlight view of the grand "cirque" and ice-mailed peaks around, and the glorious sunrise flush which succeeded it; then mounting the left side of the glacier, which was but little crevassed, we gradually rounded the base of the eastern peak of the mountain. Arrived at some rocks where the tributary glacier from between the two summits joined the main stream, we halted to put on the rope, before we turned up the face of the mountain. Ascending at first by rocks, afterwards by broken slopes of nevé, we gained height rapidly, bearing somewhat towards the base of the west summit. At 6·30 A.M. we found ourselves at 14,800 feet above the sea, only 1800 feet below the top. Some fine snow-peaks, which we afterwards knew better as the Adai Khokh group, were conspicuous to the west. At this time the view was magnificent and perfectly clear; to the south the eye already ranged over the main chain of the Caucasus, and across the valley of the Kur to the hills beyond, while behind the rugged ridges which rise on the east of the Terek valley, the peaks of Daghestan raised their snowy heads. From this point our difficulties began: the crevasses became large, and had to be dodged; François resigned the lead to Tucker for 40 minutes, during which the favouring snow-slope was exchanged for blue ice, covered with a treacherous 4 inches of loose snow. The work of cutting steps in this was laborious, and François presently again went to the front. An incident soon occurred which might have been serious. A huge icicle-fringed crack in the ice, 3 or 4 feet wide, of which the upper lip was about 5 feet above the under, barred our progress. (Any Alpine climber will recognise his old enemy the Bergschrund). François was leading; we had all safely passed the obstacle, when the rope, which in the difficulty of the passage had become slackened between Tucker and Moore, hitched round one of the big icicles in the crack. Having in vain tried to unhitch it, Tucker began to cut steps downwards towards the upper lip of the crevasse. At no time is this an easy thing to do: try to do it in a hurry, and what now happened is almost sure to occur; the step-cutter overbalanced himself, his feet slipped out of the shallow footholds, and he shot at once over the chasm. The rope tightened with a jerk on Moore and myself, who however held fast, and we had to hold for many seconds before our companion, whose head was down the slope, regained his footing. The escape was a narrow one, and we had reason to be thankful that neither the rope nor our axes failed us at so critical a moment.

Our order re-established, we attacked the exceedingly steep ice-slope which separated us from the gap between the two summits. This part of the ascent was extremely difficult and required the greatest care. The ice was thinly coated with snow; sometimes rendering the climb easier, but generally more dangerous. Now and then the snow was thick enough for a few yards, to allow us to dispense with cutting steps through into the ice, but more often it impeded our progress, as, aided by a strong wind, it filled up the footholds almost as soon as they were made, and obliged each man to rescoop them. For four hours we had to cling to the slippery staircase, with knees and hands, as well as feet and ice-axes, exposed to a furious wind, which drove showers of snow and ice into our faces. In such a position time flies rapidly, and it was not until 11 A.M., when François was again exhausted with the labour of leading, that we gained the saddle between the two summits. Our first care was to examine the ground below us to the north where a steep slope fell away from our standing place to a great nevé plateau about 2000 feet beneath. We rejoiced to see no serious difficulty, for we had all independently arrived at one conclusion—

that nothing short of dire necessity should make us descend the way we had come up. There was no doubt now that the east peak was the highest; so, after snatching a morsel of food, we left François to recover himself on the snow, and set out afresh by ourselves, Tucker leading. The final climb was not difficult: we cut steps up a bank of hard snow, scaled some rocks (where François rejoined us), and then found ourselves on the snow cupola which crowns the mountain. A few steps brought us to the edge of the south cliffs, along which we mounted; the snow-ridge soon ceased to ascend, then it fell away before us; we saw for the first time, the valley of the Terek under our feet, and knew that we stood on the highest summit of Kasbek. It was just mid-day. The cold, arising from the high wind, would not allow us to stop on the actual crest; but we sat down half a dozen feet below it, and tried to take in, as far as possible, the vast panorama spread out beneath us. Clouds had by this time choked up the valleys, and covered the great northern plain, but the mountain peaks were for the most part clear. We were surprised at the apparent grandeur of the ranges to the east, where group beyond group of snowy peaks stretched away to the far off Basardjusi (14,772), the monarch of the Eastern Caucasus. Nearer, therefore more conspicuous, was the fine peak of Schebulos (14,781). To the west the first object which caught the eye was the lower, western, summit of Kasbek, an ugly looking peak with its long knife-edge of ice and rock. In the distance we eagerly sought for Elbruz, but found it not: whether veiled by clouds, or hidden behind the projecting masses of the Koschtantau group, I cannot say. (We fancied afterwards that we recognised Kasbek from Elbruz; of course in this case the converse is possible, but the distance between the two mountains is great—120 miles as the crow flies—and we cannot speak positively on the subject.) Except in the immediate vicinity of Kasbek there seemed to be but few and small glaciers nearer than the Adai-Khokh group on the further side of the Ardon Valley.

After a stay of about 10 minutes we quitted the summit, where we could not leave any trace of our visit. We had no stick to fix upon the snow dome; we could not spare an ice-axe, and the rocks were too big to use in building a stone-man. The return to the gap was quick and easy; we did not halt there long, knowing we had a long afternoon's work before us.

The first 100 feet of descent down the hard snowbank on the north side was steep enough; I was ahead, and too lazy to cut good steps; an error which caused Moore's barometer a jolt which upset it for several hours, happily the little thing recovered during the night, and told us our approximate heights for many a day afterwards. The slope soon lessened, and allowed us to give up axe-work, and we trudged straight and steadily downwards until we were almost on a level with the extensive snow-fields we had looked down on from above. There we halted to consider our course. We were on an unknown snow-plain, 14,000 feet above the sea, and it was most undesirable to risk our chance of reaching "terra cognita" ere nightfall, by any rash or hasty move. One plan suggested was to turn to the left, and cross a snowy ridge we had reason to believe divided the plateau we were on from the nevé of the glacier by which we had ascended; this course, if successfully followed, would bring us back to our tent and baggage. The fatal objection was its probable length. We determined to keep nearly due north across the snow-field towards a ridge, dividing two glaciers which flow into different branches of the glen of Devdorak. There was no difficulty in crossing the plateau to the rocks which bound the first glacier on the north. We kept under the rocks on the left side of the glacier, until the ice became so steep and broken that the possibility of further descent by it seemed doubtful, and after some delay (while François reconnoitred) we climbed to the crest of the ridge at a point where it is crowned by two very remarkable isolated rock-towers which are seen from afar, and may be useful as finger-posts to future climbers. The view of Kasbek from here is superb; its whole north-east side is a sheet of snow and ice broken by the steepness of the slope into magnificent towers, and seamed by deep blue chasms.

We were now glad to find a reasonable prospect of returning from our eyrie to the lower world without too much difficulty. We followed the ridge between the two glens, sometimes we crossed a snowy plain, sometimes hurrying down rocky banks, until a series of long snow-slopes allowed us to glissade merrily to the rocks at the foot of the second glacier. A rocky barrier shut out the view of the lower part of the glen; before we reached its brow, mists swept round us, and for two hours we were enshrouded in a dense fog. We traversed a savage gorge, pressed in on either side by huge walls of crag, where but for the path afforded by the avalanche-snows which covered the torrent we should have been puzzled to find a means of exit; when this aid failed us, the bed of the stream became a mere cleft in the rocks; we made a sharp but short ascent to the right and happily hit on a barely traceable track, which led us down by steep zigzags into the same glen below. More than once the track was lost and found; until the mists having lifted somewhat, we at length saw that we were close to the junction of the torrent with that from the principal Devdorak glacier. Cows and goats were grazing on the grassy brow between the two streams, and as it was now 7·45 P.M., we debated whether to stop here for the night.

The herdsmen, an old man and two boys, gave us information which decided the question. Our communications were by pantomime, but we gathered without much difficulty that the Devdorak torrent was bridgeless and big, that they had fresh milk, and would allow us to share their shelter. It was but a hollow under a partially overhanging cliff, enclosed by a low wall that afforded poor protection against the attacks of inquisitive sheep and goats and the drizzling rain which fell all night, but we managed, with stones for pillows, to snatch a good deal of sleep.

The preparations for our start the next morning did not take long. The chief herdsman accompanied us to the Devdorak torrent, which at this time of day was fordable; and one of the boys volunteered to go with us to the post station, and relieve François of some of our traps. A well marked path led us above the united torrents; on a neighbouring brow we were told stands a pile of stones, resembling an altar in shape, and covered with the horns of chamois and bouquetin. This spot is held sacred by the pagan inhabitants of the neighbouring village, and once a year they all repair here, sing strange chaunts, and make offerings to the "genius loci." Ere long the defile of the Dariel opened beneath us, and a short descent brought us to the Terek. After half a mile along a meadow covered with old tombstones, we crossed by a bridge to the high road. A long up-hill pull of 8 versts (5½ miles) brought us to the village of Kasbek, and about 9 A.M. our best "jodels" aroused the people at the post station. Our arrival did not create much excitement at first. The people seemed to take it as a matter of course that we had not really been to the top, but equally as a matter of course that we should say we had. We roused up Paul, who, still unable to shake off an attack of fever, was in a very stupid and gloomy mood; through him we sent off a messenger to look for our porters, whom we had left encamped at 11,000 feet the previous morning. The commission was quickly executed. In the evening the porters returned, bringing in safety all our belongings, including a pair of spectacles, which had been mislaid in a start in the dark. The men had supposed us lost, and now, overjoyed to see us again, talked, kissed, and hugged us all simultaneously. The excitement among the villagers grew intense. The porters told them that we had disappeared up the mountain, and that our tracks were visible to a great height on the southern face, the shepherd boy was a witness to our mysterious appearance on the other side the same evening; the two facts showed that we must have crossed the mountain very near the top, and we suddenly found ourselves installed as heroes instead of humbugs in the public opinion of Kasbek village. The old men's chorus by whose help our first arrangements were made, came in during our supper, when more kissing and hugging had to be endured. The chief of the party was very excited and enthusiastic in his congratulations, and dilated at length on the captains, colonels, and even generals, who with companies of Cossacks to aid them, had desired to do what we had done, and failed. We tried to explain to him the use of ropes and ice-axes, and to show that they were much more useful on a snow-mountain than any number of Cossacks.

THE CHAIN OF THE CAUCASUS. KASBEK TO ELBRUZ.

July 3.—It was less than a week since we had left Tiflis; already the first piece in our programme was accomplished; and the most formidable of the two great peaks we had pledged ourselves to attack was successfully disposed of. We had now to turn our thoughts to the less imposing, but really far more difficult, task of making our way along the foot of the main chain of the Caucasus from Kasbek to Elbruz, a distance of 120 miles. Before leaving England, we had studied German maps, which, although shown by better acquaintance with the country to be often inaccurate, yet gave a sufficiently correct idea of the disposition of the upper valleys on either side of the watershed, to enable us to form a plan for our proposed "high-level route." Since landing at Poti, we had learnt that the Mamisson, one of the passes we intended to cross, was well known to, and occasionally used by, the Russians. Beyond this we could gain from the officials little information, and the plan of the journey we had worked out was scouted by them as impossible. A volume given me by Herr Radde, containing the account of his last explorations in the higher valleys of Mingrelia, showed us that he had traversed, at different times, all the country west of the Mamisson, to a point south of Elbruz, with the exception of one short link, between the valleys of the Rion and Tskenis Squali. It is, however, one thing to make excursions from a base to which you can return for supplies, and where you can leave much of your baggage, and another to push on from point to point, carrying everything with you, and harassed by the constant difficulty of engaging fresh porters. We saw no reason, however, to give up our original plan, despite the small encouragement it had received from others, and accordingly, on the morning after our return from the ascent of Kasbek, we were ready to drive back to Kobi, where we purposed to bid farewell to post-roads, and such civilisation as they carry with them, and to adventure ourselves among the primitive paths and native inhabitants of the mountains.

The upper basins are enclosed by double ranges, for on both flanks the main chain is guarded by lower, but very considerable limestone ridges, the continuity of which is broken by deep gorges, through which the rivers, rising in the glaciers of the central mass, force their way. In this part of the chain—that is, from Suanetia on the west, to the east source of the Rion, the relations of the watershed and the two lateral ridges, though sometimes interrupted, or rendered indistinct, are on the whole easily traceable. The next section eastwards presents, at first sight on the map, a curiously changed aspect. The watershed having for so large a space run from north-west to south-east, bends suddenly due south, and sinks to the comparatively low gap of the Mamisson Pass. After a few miles it resumes its former direction, but entirely fails to recover its former grandeur. Although peaks rise frequently to heights of 11,000 and 12,000 feet, they support but few and small glaciers; and the passes between them vary from 7500 feet (the height of the Krestowaja Gora) to 9000 feet. North of this unworthy watershed we find a line of summits averaging at least 14,000 feet, and terminating in the noble outwork of Kasbek, 16,540 feet. A second glance at the map shows that this row of noble peaks is in an exact line with the glacier-crowned chain which forms the watershed further west; and that the ridge which now divides the basins of the Kur and the Terek, is in fact the continuation of the southern lateral range.

There are three points in the configuration of the Caucasus which I may here point out—first, that many of the upper valleys are troughs running parallel to the main chain; secondly, that these mountains differ from the Alps in having no lakes corresponding to those of Switzerland or Lombardy on either side of them; thirdly, the chain has no ramifications corresponding to those of the Alps in the Oberland and Tödi groups.

When we left Kobi, the obvious line of march for a party who wished to follow as closely as possible the foot of the main chain, where the finest scenery might be expected to be found, was to ascend the Terek to its source, cross to the Ardon, descend the eastern, and mount the western branch of that river, traverse the main chain by the Mamisson Pass, then work along the upper basins of the Rion and Ingur.

The only difficulty apparent on the map was the transit from the head-waters of the Rion to those of the Ingur, where several ridges enclosing the sources of the Tzkenis Squali barred the way, and the glens between them seemed to be without inhabitants.

In order to make our course as clear as possible, I shall divide our journey into five stages. The 1st, through the north valleys to the Mamisson Pass, where we crossed the main chain; the 2nd, the Rion basin; the 3rd, the sources of the Tzkenis Squali; the 4th, Suanetia, or the upper Ingur valley; and the 5th, the Baksan valley and Elbruz.

It took us four days to reach the south side of the Mamisson Pass from Kasbek. On the second we crossed, by a pass at least 10,500 feet in height, from the source of the Terek to that of the Ardon. The upper valleys of these two rivers are entirely bare of trees, and the scenery is consequently savage and somewhat monotonous. Owing to the want of wood in this district, the house are built entirely of stone; they are generally gloomy-looking masses of rough masonry, in which small holes are left for the windows; but the peculiar character of the villages is given by the number of towers which they contain, often in the proportion of two towers to three houses. There is nothing picturesque in these primitive fortresses, which, from their walls sloping inwards towards the top, resemble an elevated brick-kiln. At Res, the highest village in the Terek valley, we had to leave our horses and engage porters. The weight each man carried was ludicrously small, and we were forced in consequence to take a train of ten. The boots of these Caucasian mountaineers are too peculiar to be passed over without mention. A tangle of leather bands is stuffed with dry grass, and then bound round the foot, the sole being thus removable at pleasure. These primitive sandals seem to be everlasting, and to afford the feet sufficient protection from rocks and cold. For some time we thought they must fail on snow or ice; but the way in which the Pari men, thus shod, climbed the steep slopes between the valleys of the Ingur and Baksan quite removed this prejudice.

On reaching Zacca, the highest village in the Ardon valley, the Res men had to be paid off. At first they quietly accepted the sum agreed upon, but soon began to clamour for an extra rouble, as "backsheish," or "trinkgeld," or whatever is the Ossete synonym for those world-wide terms. We had sought refuge from a noisy and intrusive crowd of villagers, in a house close by, where we admitted only a select few of the elders, to satisfy their curiosity. At first we took no heed to the everyday sound of angry voices; but the row becoming serious, my friends sallied forth and found the Res men hustling Paul, who, spluttering with rage, was laying about him with a stout stick, while the people looked on and laughed. One of the Res scoundrels now seized Paul's sheep's-skin cloak, and they all hastily retired, carrying it with them. At this point of the proceedings I came upon the scene—saw Paul frantically excited, and our late porters, in a knot fifty yards off, with our cloak in their possession. Ignorant of what had passed, and fancying that a prompt move would settle the question, I ran up to the men of Res, took hold of the cloak, and motioned to them to drop it. Far from this, they began to pommel me after a fashion—fortunately a very harmless one, consisting of roundabout windmill pats on the top of the head. This may be a very effectual way of bonneting an adversary who wears a tall sheepskin; but it is singularly harmless to a man with a hard wideawake. In self-defence I quickly dropped the cloak. In a few seconds my friends came to the rescue—one hitting straight into the eyes of the thieves; the other charging them with his ice-axe. After some dozen blows had been given, the foe suddenly fled, carrying off the cloak with them, but leaving us in possession of the field of battle, and did not stop until they had put the river between us. Our next move was to turn to the chief of the village, ask how it was that he stood by and allowed strangers to be robbed, his own people aiding and abetting the thieves? The only reply of this noble mountaineer was, that he would get back the cloak if we would pay him for it! This was an Ossete, one of the tribe Count Leverschoff told me that we should find the "gentlemen of the mountains." This tribe is one of the most celebrated of the Caucasus, and has caused some disputes among Russian ethnologists, owing to their having a peculiar language, of which many words are said to resemble German. They have been converted to Christianity, which they now profess, although they trouble themselves little about either its letter or spirit. Their worship is mixed up with sacrificial feasts of apparently pagan origin, and the doctrines they hold are compatible with a severe law of vengeance, resulting in long and bloody feuds between families and villages. There seems to be no poor class among them; all the men we saw were well and even handsomely dressed. The tall sheepskin hat is universal, and great attention is bestowed on the numerous ornamental details of their costume. The cartouche-boxes on the breast are generally inlaid with silver. When they go abroad, they invariably wear a belt, to which is attached a double-edged dagger, like the Roman short-sword, enclosed in an ornamented sheath; on the other side hangs a heavy flint-and-steel pistol; besides these, they carry a variety of smaller necessaries, such as a leather case for tinder and flints, a knife, and a little box of oxidized silver, prettily worked, in which they keep the grease to anoint their bullets.

We slept two hours below Zacca. The next day, in order to reach the lower valley, we had to cross a grassy ridge, over 9500 feet in height, whence we gained an admirable panorama; from hence to the Rion valley we met with nothing remarkable either in scenery or adventure.

The change of scenery which awaits the traveller who passes from the treeless valley of the Ardon, into the richly-wooded basin of the Rion, which I have called the second stage of our journey, is marvellous and sudden. The upper basin of the Rion consists of two valleys—that of the real Rion, and of its first considerable affluent, the Dshandshachi Squali, which both run parallel to the chain for many miles, until at their junction they turn south, and find an exit through a narrow gorge, between the serrated ranges of the Schoda and the Wallatschibis mountains, which shut in the upper valley on the south. On the north, behind a mass of rounded "vorberge," the summits of which barely rise above the limit of the forests, towers the continuous wall of the main chain of the Caucasus. The highest peak of this part of it looks down on the east end of the basin, and is well seen from the valley. What it ought to be called is still uncertain. On the five-verst map we find the name of Adai Khokh given, and a height of 15,244 feet assigned it; but Herr Radde dissents from this, and says that the people of Glola call it the Twiulsas Mountain. Caucasian nomenclature is in an almost hopeless state of confusion. The five-verst map, our chief stand-by, is constantly contradicted by Herr Radde's more careful researches, which he has unfortunately not as yet embodied in any corrected map. I shall, therefore, avoid giving more names than are necessary; and I think that if I give the commencement of a catalogue of the peaks north of the Rion sources, my readers will thank me for my forbearance. They are the Sarziwisdsiris Mountain, the Sagebigora, and the Chiorölioto, and the Sopchitigoram Mountain. I do not think I need go any further!

The lower slopes of the Rion basin are clothed with the most magnificent forests. The botany of the country has been dwelt on at length by Radde, and those interested in it will find copious details in his work. I shall confine myself to general features. The pines are not here, as in the Alps, the highest trees. Above them is found a zone of birch, terminating at about 7500 feet, which, speaking roughly, may be taken as the limit of trees in the Caucasus. Higher still we come upon dense masses of white Caucasian rhododendron, which takes the place of the pink alpenrosen, and is succeeded by gentians and the common Alpine flowers, which grow just below the snow-level. We were delighted to find many English friends among the flora of a Caucasian Alp, such as snowdrops, cowslips, and primroses. Under the shade of the forest, and in its glades, grows a thick underwood of azaleas—wild honeysuckles and roses. The effect of deciduous trees growing nearest the snow is very striking—the upper pasturages of the Caucasus thus often combining the grandeur of the Wengern Alp with the woodland attractions of an English park. The inhabitants of this beautiful valley are of a very different race to the Ossetes, whom they do not equal either in personal appearance or dress. Their cartouche-boxes are of wood or bone; their dagger-sheaths and belts are unornamented with silver; and in place of the tall sheep's-skin hat, they wear a headdress, either the baschlic, tied up in a sort of turban, or felt wideawakes of the most varied and eccentric shapes. They look what they are—needy peasants. They are, however, less hostile to strangers, and in the villages in the east branch of the valley (which, owing to their being on the road to the Mamisson, are more under Russian influence) we found the people really hospitably disposed. At Gebi and Tschiora, in the west valley, our dress, accoutrements, and luggage were a source of unaccountable amusement to the large circle of which we were constantly the centre. The greatest excitement was caused by the sight of our pocket-handkerchiefs and our manner of using them; a performance the repetition of which, after it had been once witnessed, was looked forward to with eager expectation. It is a difficult thing to blow one's nose in a duly solemn and dignified manner before an audience of 150 people; but we had frequently to do it. Though we were objects of intense curiosity, and of frequent attempts at imposition, we had no reason in this valley to complain of any annoyances which may not be met with in countries far more civilised than the Caucasus. Thus much knowledge of the Rion valley was easy to attain; but we were not satisfied to rest in ignorance of what lay beyond and behind the snowy wall which bounded every northward view. We wanted to learn something of the breadth and character of the central ridge of the Caucasus.

To follow out these views, we left Paul and the baggag [illegible]
Tschiora, and taking François with us, we set out at 2 [illegible]
the 10th, to cross the main chain by a glacier-pass, know [illegible]
natives, to the valley of the Uruch. A porter came [illegible]
the snow-level. We had a lo [illegible] walk along gr [illegible]
finally over one of 8500 feet, [illegible] down by a prov [illegible]
to an alp, wooded like an [illegible]
tall snow-peak. The head [illegible]
steep glacier. A long [illegible]
us above the icefall. [illegible]
St. Theodule; there [illegible]

prised to meet large flocks of sheep crossing the chain; but the animals (including the dogs) seemed quite accustomed to the work. We missed the usual pass, and unintentionally made a new "col" by going up to the head of the southern glacier. The col itself was a most curious notch, with little distant view; the scene was of extreme wildness and grandeur—great towers of rock shooting out from below, between which a very steep snow-slope plunged down to the glacier. The descent of the snow-wall, although terrifically steep, and practicable only owing to the perfect condition of the snow, was not difficult, and brought us down on a glacier flowing north-east into the Zenaga valley. There were no crevasses, and we bowled down to its foot, then through a rough glen, and emerged on a knoll overlooking an enormous glacier, coming from we could not tell where, and falling beneath us into a fir-clad valley, in which we could see the fields and villages. Here, at a height of about 7000 feet, we found a patch of pine forest, lying close to the junction of the glens, and made a snug bivouac under an overhanging rock, with a spring of water handy.

At daybreak the next morning we set out to force our way back over the great glacier to the Rion valley. An hour was consumed in getting over the very rough ground at the mouth of the glen we had descended in the evening; then we found a capital path, which led us along the side of the glacier to a shepherd's hut, whence we got our first view of the work before us. In the foreground was the broad stream of the lower glacier, which poured out between two magnificent rock-peaks, terribly escarped, of at least 14,000 feet in height. Directly between these great cliffs was an enormous ice-fall, nearly 4000 feet in height. We were about three hours to its foot. For some time all went well; but difficulties got thicker and thicker, till, after trying place after place, going round some big crevasses, and descending into others, we nearly despaired of making a way through the magnificent séracs of the great ice-fall. Time and the axe, however, did their work; and after spending six hours among the séracs, we were fairly on the upper snowfields. The extent of these, as they gradually opened to us, was almost appalling. They seemed Himalayan in magnitude, but allowance must be made for novelty; and I daresay that, if the first explorer of the Oberland had forced his way up the Jungfrau Joch, he would have been rather taken aback by the view of the Aletsch glacier. We were surrounded on all sides by rugged peaks. The nevé spread away in two great bays. Utterly ignorant of our exact position, we selected the western. The snow was tolerably soft, and the work heavy, each man taking the lead in turn. At last (about 4 P.M.) a distant peak rose over the snow before us, and we found ourselves on an almost imperceptible watershed, overlooking the green ridges and dark forest-clad valleys of the Radscha, the general name given to the district between Koutais and the main chain. Soon, however, the slope steepened, and a comparatively short glacier plunged down from our feet. Its ice-fall seemed impassable, and remounting, we found at last that friend in need, the snow couloir, which let us comfortably down to the lower world, and we succeeded in reaching the forest ere nightfall. We halted beside a brook, and slept as well as could be expected on a steep slope, where we had to pile branches to make a couch sufficiently level to prevent our rolling down into the water in our sleep. The weather for the last two days had been lovely; now rain threatened, but fortunately held off. We descended next morning to the Rion valley at Glola—having completely succeeded in our object—to learn something of the real character of the central ridge at this point.

The result of our double passage of the chain on either side of Tau Burdisula was to show the important position of that peak, and its character as the corner-stone of one of the principal groups of the Caucasus. From the western sources of the Rion to this mountain the central chain is a single ridge, and is too narrow to support nevé plateaux, capable of feeding a first-class glacier. From Tau Burdisula a second chain, nearly if not quite equal in height to the watershed, branches off, and the two ridges, running for some distance nearly parallel, enclose between them the great snow-fields, which find an exit to the north in the tremendous ice-fall up which we had forced our way. From the complication of its ridges, the heights of its peaks, and the number and size of its glaciers, the portion of the chain between Tau Burdisula and the Mamisson well deserves to be distinguished as a group after the manner of the Monte Rosa, or the Mont Blanc group; but while the name of its highest summit remains uncertain, I cannot presume to fix on the title which will best befit it.

The next stage in our journey was the three days' walk, or rather struggle, through wet woods, from the Sassagonelli Alp, at the head-waters of the Rion, to Jibiani, the highest village in the Ingur valley. During this time we were threading the valleys which contain the sources of the Tzkenis Squali. Most of the maps and books which treat of the Caucasus fall into serious error in this neighbourhood. They represent the Tzkenis Squali as rising entirely on the south side of a spur of the main chain, and give the idea that only one ridge separates the Rion and the Ingur; whereas it is necessary to traverse no less than three ridges between them. I can say nothing of the inhabitants, for the best of reasons, that we did not meet any. There are now no villages, or even shepherds' cabins, in the upper valley, although the ruins which here and there rise above the dense forests show that this has not always been the case. The central chain is less imposing here than further east or west, and the distinguishing feature of the country is the extraordinary rankness of the herbage, which is brought more home to a traveller's feelings by the general absence of path, which compels him to force his way through the tangled forest. Once descended from the ridge of the Goribolo, which separates the Rion and Eastern Tzkenis Squali, we were either entangled in dense thickets or wading in the glades, through vegetation always up to our shoulders, and often above our heads, consisting of hemlocks and other weeds, interspersed with superb tiger-lilies. Sometimes the track of a bear came as a most welcome aid to the pioneer, who had heavy work in choosing and pushing his way through this tangled wilderness of swamps, thickets, and torrents, the stony beds of which formed the only tolerable roads. Herr Radde, the first, and I believe the only European besides ourselves who has visited this recess of the mountains, accounts as follows for the rank undergrowth which covers it:—"The frosts of autumn kill down the summer's growth, and leave it rotting on the ground. The rich soil formed by its decay is covered by the winter snows, often to a height of 30 feet. As spring advances, the water of the melting snow percolates the ground; and when it is at last laid bare to the warm rays of a Caucasian sun, the herbs spring as from a hot-bed from the saturated soil." Whatever may be the cause, it is certain that the weeds of the Tzkenis Squali would gain the prize anywhere, and that a more curious sight than their gigantic leaves, and huge heads of blossom, it would be hard to find. This luxuriant vegetation produces swarms of mosquitoes and small black flies, which render a night spent in the forest almost unendurable. In addition to these inconveniences, we were persecuted by rain, which persistently fell every day, damping our goods, and spoiling the pleasure and comfort of our encampments. Altogether we were not sorry when we crested the last ridge that divided us from "Suanetia," or the upper basin of the Ingur, the fourth stage of our journey, and the last on the southern side of the main chain. The district we are now entering, the upper basin of the Ingur, is perhaps the most interesting of the whole Caucasus, whether regard is had to its scenery or its people. A large basin, 40 miles long by 15 broad is encircled by glacier-crowned ridges, and divided into numerous wooded gorges and meadow-basins by lower spurs. It is accessible from the outer world only by a narrow, and, at times, impassable ravine, or by lofty mountain-passes. Hence the natives have always been considered as a people apart, and the upper glens have been renowned as harbouring the most savage and untameable of the Caucasian races—as being, in fact, a sink of iniquity, where robbers and murderers, who found their own homes too hot for them, could obtain a sure refuge. One would have thought the murder of so high an official as the Governor of Mingrelia by the Prince of Suanetia, eight years ago, would have brought down Russian vengeance on the district, and that military rule would have soon extirpated this nest of robbers. On the contrary, the policy pursued by the Government is one of mildness, or rather of indifference. The Russian officers have learnt, by experience, the difficulty and expense of maintaining any considerable force in so isolated a position, and very naturally prefer to let the villagers go on fighting out their own quarrels, in the hope that they will some day be exterminated, like the Kilkenny cats. The ten Cossacks stationed at Pari, at the lower or western extremity of Suanetia, are the entire executive force at the disposal of the chief of the district; and the upper or eastern valleys are, for all practical purposes, independent, and at full liberty to follow their own wicked ways. This eastern half has never been subject even to a native prince; each group of villages has governed itself under no other law than that

"—— good old rule, that simple plan,
That he should take who has the power,
And he should keep who can."

Herr Radde very fairly describes the type of the inhabitants of these villages thus:—"In the expression of their countenances, insolence and rudeness are prominent. Hoary-headed obstinacy is there often united to the stupidity of savage animal life. These people have often each committed ten or more murders, which they generally consider not only allowable but necessary. They are naturally taciturn, and their whole expression, when attempting to take advantage of strangers, is most disagreeable."

Herr Radde, an official of the Government, and, we are bound to suppose, provided with all the aid it could give him, was robbed of a horse at Jibiani; he had to make a circuit through the mountains on account of local feuds, which had at the moment blazed out into open war, and so slink through Adisch by night, because of the notorious brigandage of the inhabitants. We had not time to study the Herr's book before we left Tiflis, and did not know the character of the people we were to encounter; so that it was with feelings of unmixed pleasure that we saw the towers of the highest group of villages appear before us.

Every house in Utschkul (a group of hamlets, of which Jibiani is the highest) is a fortress, built of stone, with slits for windows, and surmounted by a tower, which gives the place at a distance the look of a chess-board covered with nothing but castles. We spent Saturday in the village of Jibiani, where we got possession of a barn. Our reception was inhospitable, and during the day the people became more and more disagreeable; committing petty thefts and otherwise annoying us. Our tent being set out to dry, one of the sticks was carried off, and we had to pay some copecks to get it back. Altogether things looked like a row,—but we made a great impression by ostentatiously firing off and reloading our revolvers.

We found a man from a lower village, who promised to be ready with two horses to carry our baggage down the valley the next morning; when the time came, he seemed in league with the villagers, and the second horse failed. Knowing that we should be unable to make a start with local porters, we determined each to carry a saddle-bag, and be independent; meantime extortionate demands were made, which we partly conceded, partly resisted, while we got the horse loaded and the luggage in a heap. When the opportune moment came a start was ordered, and we marched out of the barn; but François and Paul stupidly loitered, and let the natives shut them in. A blow from my ice-axe quickly sent the door in; a ruffian then put himself in the way, but the application of a revolver-barrel to his face made him retire hastily. Forming a kind of hollow square, the horse in the middle, with our hands on our revolvers, we now marched out of the village by a sunk lane, where the inhabitants, yelling and jabbering, jumped down in front to bar our way, while others brandished weapons on either wall. A concession of some copecks to one rascal caused a scramble and diversion, during which we got away. There is no doubt that, but for our heavy armament, petty theft would have been turned into open robbery; fifteen barrels have always a moral effect, the difficulty lies in enforcing it without actual fighting, which, of course, would be the last resource, not only dangerous, but necessitating immediate flight from the country. Once clear of Jibiani, we passed on quietly through the lower hamlet, above a fine defile, and down a sharp descent to Davker, our horseman's home. Here he tried on his little game, and even went so far as to draw his pistol. He was quite at a loss what to do next, and we laughed at him so heartily, that he was glad in the end to renew the original engagement. There were only half-a-dozen people about, so we had no anxiety, and could take things easily. We secured two good porters, and in the afternoon set off up a fine lateral glen.

Time would prevent my entering into the details of the exquisite scenery through which we passed from here to Pari; but I cannot pass by unmentioned the icefall of the Adisch glacier (which we thought at the time, and still believe, far surpasses anything of the kind in the Alps), or the parklike verdure of the ridge which separates the north valley of Mushalaliz from the wooded gorge of the main stream of the Ingur. The path which follows this ridge from Adisch to Cumè is the loveliest imaginable. It winds under woods of birch, ash, oak, and fir, through thickets of rhododendron and azalea; where, at every break in the forest, the eye catches glimpses, on one side, of the green meadows and white-towered villages of the Mushalaliz valley; on the other, the deep-wooded ravine of the Ingur, and the snowy heads of the Leila group. Latal, lower down the valley, is in a situation of almost perfect beauty, with the graceful snow-cone of Tau-Totonal, or Tetnuld, closing one view, and the glacier-crowned, forest-girt Leila Mountains immediately opposite. A climb up the hill-side above, reveals the whole southern face of the great wall of ice and rocks which stretches for 12 miles from Tetnuld to above Jibiani, and brings into sight on the north the king of all the Suanetian Alps; the double-peaked Uschba, which I can describe only by likening it to several Matterhorns, piled on the top of one another, and multiplied by two.

The topography of this upper basin of the Ingur is simple in its leading features, though complicated in details, such as the relations to one another of the upper glens. The main-chain of the Caucasus reaches its greatest elevation and true central point in the mountain mass which towers over its offshoots in the sources of the Ingur, as Monte Rosa towers over the ridges on its Italian side. Tau-Totonal must be over 16,000 feet in height, and the summits of the serrated range which stretches for several miles from it to the east, cannot average less than 15,000 feet. Three glaciers—the Nuamquam, the Gorosko, and the Adisch—flow down from it into three several glens; they descend to a level of about 7000 feet, which may be taken as the lowest point reached by glacier on the southern side of the Caucasus. The chain from Totonal to Uschba (called also Besotch Mountain by Radde) makes a considerable sweep to the north, and at least two large glaciers—the Thuber and Gatun Tau—descend from it into the Mushalaliz valley. Over one of these—the Thuber—the natives from the northern side often cross with merchandise. Uschba is a gigantic promontory, and, like so many of the highest peaks, is not on the watershed, but it is the only one I know of that is on the southern side.

West of Uschba the range is still covered with glaciers, across which two passes leading into the Baksan, and one into the Karatschai valley, are known to the natives. On the south side Suanetia is cut off from the world by the Leila group, the continuation of the limestone ridge, which, as I have before observed, runs parallel to the main chain along the whole of the western Caucasus. The passes over it were described to us as fatiguing, but not difficult.

From the ten Cossacks stationed at Pari we met with the greatest kindness; they did all in their power to make our rest there pleasant, and to facilitate our arrangements for crossing to the valley of the Baksan. We were delighted to hear that the Mahometans on the north side were, by all accounts, a most hospitable people, and that we need not fear among them the extortion, insolence, and ruffianism to which we had been exposed among the so-called Christians of Suanetia.

I now enter upon the fifth stage of our journey. The pass by which we crossed the main chain from the Nakra valley (a tributary of the Ingur, which falls into it some way below Pari) to the Baksan is about 10,800 feet in height. On the south side the scenery is wild and savage; on the north the massive snow-mountain called Tungzorun is a fine feature. Although the tract leads over snow-fields and a small glacier, the natives do not hesitate to take horses across. We found everywhere in the Caucasus horses taken over passes which no Swiss peasant would think of driving even a mule over. Uruspieh, the principal village in the Upper Baksan, is seven hours down the valley, in a dull and arid situation. A comfortable two-roomed house, built in the most massive style of wood architecture, is kept for the reception of strangers. The Princes of the place, Ismail and Hamzet, were very hospitable. Having made arrangements with them for the peasants who knew most about the mountain, and had been with Russian travellers to the verge of the glacier, to accompany us, we left on July 29th on our Elbruz expedition.

We found that to get at the mountain from this side, it was necessary to reascend to the head of the Baksan valley, which is filled by a large glacier. Just before reaching it we turned up a glen chiefly remarkable for the number of snakes we found in the grass, and for the striking ridge of columnar basalt which rose above it on the west. This glen was closed by an ice-fall, an outlet of the nevé-plateau of Elbruz; we slept near the foot of the glacier, where there was a rough châlet for the men. We got capital milk, cheese, and kaimak (Devonshire cream), and might have had a lamb, so the fare of a Caucasian Alp is not to be despised. The top of Elbruz (or Mingy Tau, as all the people of the country call it), a flattened dome, was just visible.

The morning of the 30th we climbed the slopes on the true right of the ice-fall, which is beautifully broken into towers and pinnacles, and getting on to a spur of rock, found a convenient place for the tent, among broken crags, at a height of about 11,900 feet, some 500 feet below the great nevé-plateau, which spreads round the base of the mountain. By levelling a bit of ground, removing stones, and building a wall, we made our quarters tolerably snug. Meanwhile, as it was early in the day, some of the party paid a visit to the snow-plateau, and inspected the mountain, which in shape somewhat resembles an inverted tea-cup, and presents no apparent difficulty to the eye of the mountaineer. The afternoon was fine, and the view of the main chain opposite to us was splendid, specially an Ortler-like mountain (Tungzorun), and the north side of the two-headed Uschba or Besotchhita, which presents a most inaccessible appearance. The night was very cold; the water in an India-rubber bag, which we had filled overnight, was frozen inside the tent, into a solid sausage of ice, ere morning. At 2·10 A.M. (on Friday the 31st), we were off by the light of the setting moon. It was cold enough tramping across the "grand plateau," a black cloud resting on the dome above us, and lightning playing far away below over the steppes. Presently I diversified the proceedings by entirely disappearing in a concealed crevasse; as we were roped, the incident was only an amusing one, but considerable hauling was necessary before I could get out, for the crevasse was large, and the snow-crust on the side of the hole I had made, broke away when I tried to raise myself on it. Soon after, the slope steepened, the cold grew intense, and the wind almost unbearable; altogether the prospect was not cheering. The appearance of the morning star, which rose amidst flashes of lightning out of a thunder-cloud, hanging over the eastern steppe, caused a momentary sensation, but we relapsed into a state of frigid despair, which was not diminished by the sudden flight of our Mingrelian servant, fairly beaten by the intense cold. As we stood shivering at the base of the final cone, at a height of over 16,000 feet, it became a serious question whether we could go on; frost bites seemed not only possible but probable, and the wind did not abate. On the other hand, the rocks gave some shelter, and were less cold to the feet than snow. Looking back, we saw two of our porters advancing rapidly in our footsteps: we had almost decided to turn, when they came up, apparently fairly comfortable in their big sheepskins. I said, "If a porter will go on, I will go on with him" (François was complaining of his fingers). "If one goes, all go," said Moore, and so we went on, and from this moment the cold became simply disagreeable, and no longer affected our morale.

A long grind up easy rocks—a short ice couloir, where we cut a few steps—the only approach to a difficulty on the mountain, and we were on the top of what had long been our sky-line, to see as much more rock above us. Doubts were even now expressed of our success, but we persevered, and almost suddenly at last gained the crest, and, turning to the west, faced the wind for a final fight. The ridge was broad and easy; with our hands in our pockets and our ice-axes under our arms, we tramped up until it culminated in a bare patch of rock with snow all round. This summit was one end of a horse-shoe ridge, enclosing a snow-plateau, evidently an old crater (all the rock about Elbruz is volcanic). We walked round this ridge to its extremity, and visited all its summits, which are three in number; under the furthest, a boss of rock, we found shelter, and a quite endurable temperature. Running about the ridge, we none of us felt any inconvenience from the rarity of the atmosphere. Our porters pointed out the neighbouring valleys, while we tried to identify the peaks in view. To the south and east the view was cloudless. We saw the mountains of the Turkish frontier between Batoum and Achaltzik, I believe the Black Sea, and the great peaks between us and Kazbek, which looked magnificent. The Pennines from Mont Blanc are nothing compared to the east chain seen from Elbruz. The Caucassian groups are finer, and the peaks sharper. To the north the steppe was covered with fleecy vapours. We were on the top from 10·40 till about 11 o'clock; before leaving we built a stone-man on the first peak, which appeared a trifle the highest. We had some difficulty in reconciling the shape of the summit with its appearance as seen from a distance, either from the south or north, when two peaks of equal height, separated by a considerable hollow, are visible. The gap between the second and third summits we visited was not more than 150 feet deep, and we were surprised at its being so conspicuous from a distance; at the same time we walked all round the ridge, and saw that on the west the slopes fell away abruptly towards the Karatchai; the light clouds which were now sweeping up in this direction certainly could not have totally concealed any summit nearly equal in height to that on which we were. My firm belief, in which I am supported by all my companions, is that we were on the western of the two summits, seen from below; and that the eastern point of the ridge we had struck in ascending appears from a distance as a second summit. The descent was tiresome over the rocks; they were so easy that one longed to throw away the rope and "skedaddle." At our old halting-place we stopped to feed, and at 1 P.M. we broke away icicles from our hair which had been there since 3 A.M.

The snow was still in good order. We quickly returned to our bivouac, and thence to the Alp, where we were enthusiastically hugged and kissed by the other porters and shepherds, who had apparently never expected to see us again. The two porters who reached the top deserve great credit, as they came on their own account, being engaged and paid only to the bivouac; they were almost snow-blind the next day. Our return to Uruspieh caused great excitement, and, as soon as the porters had had time to tell their story, the room was filled by a crowd of wondering and excited villagers, while the air rang with a chorus of Allah-seasoned phrases of exclamation and astonishment. We should not have been believed had not the two villagers reached the top with us; as it was, the only person who professed disbelief was a Suanetian prince, who was over on a visit to the Uruspieh chiefs, and whom we had insulted on our first arrival, before we knew whence he came, by expressing very decided opinions upon the morality and manners of his subjects.

On leaving Uruspieh we were puzzled how to requite the kindness of our hosts. We had partially satisfied our consciences by presenting a drinking-cup to Ismail, the eldest brother, when the Princess, his sister, caused to be conveyed to us, through a domestic, a special request that we would leave behind for her use an article of toilet—one of the very few we had—which she had seen and admired; we of course gratified the Princess's wish, and yielded up the object on which she had set her affections—a big bath-sponge.

From Uruspieh we rode down in two days to Patigorsk, where we spent nearly a week, enjoying the luxuries of civilisation. We had now completed the programme with which we left England, but our journey was not altogether satisfactory. Owing to the impossibility of separating from our luggage, and leaving it to the tender mercies of the Suanetian villagers, we had failed to penetrate the Koschtan Tau group, or to gain any knowledge of it beyond the outside aspect of its steep southern face. We therefore determined now to supplement our travels by penetrating from Naltschik to the head of the valley of the Tscherek (a river to be carefully distinguished from the Terek), which has its source in the glaciers immediately at the base of Dych Tau and Koschtan Tau, and on the north of the peaks which overlook the sources of the Ingur and Rion. We proposed to make our way back to the post-road near Vladikavkaz by the valley of the Uruch.

In carrying out these plans we were much aided by the courtesy of General Loris Melikoff, the commandant of the troops in the northern Caucasus, who sent a Cossack up the valley of the Uruch to meet us, and give us any assistance we might require.

The limestone gorges, through which the Tscherek and Uruch have found a way out to the northern steppe, are of the most magnificent description. They are not mere cracks, like the Via Mala or Pfeffers, but enormous trenches cut down from the tops of the mountains to a depth of 5000 feet, in walls broken only by shelves and ledges, along which the paths to the upper villages find a circuitous and difficult passage. The magnificent trees which clothe these ledges add greatly to the effect of the defiles, which are both unequalled in Switzerland, although in deciding between them I should award the palm for savage wildness and grandeur to that of the Tscherek.

At Balkar, the upper group of villages in the Tscherek valley, we were entertained most hospitably by a Mohammedan chief. It is a day's journey to the glaciers at the head of the valley, which abounds in pasturages, which in summer support numerous flocks. A guard is stationed here to prevent the depretions of marauders coming from the south side of the chain.

We tented out for two nights at the junction of the two torrents which form the Tscherek, before crossing the Stule Veesk Pass to the Uruch, and as the weather fortunately cleared we obtained fine views of the east flanks of Koschtan Tau and Dych Tau. These two granite peaks (respectively 17,000 and 16,900 feet) would, but for the chance eruption of Elbruz, have been the true kings of the Caucasus, and one cannot help feeling a regret that such a bloated and uninteresting monarch of mountains as Elbruz should have put aside two such fine fellows. Dych Tau is a sharp rock-peak, very formidable to a climber, Koschtan Tau is a long icy crest, with escarped sides. We saw no way up either of them from the east. Two large glaciers descend into the head of the Tscherek valley; they are most incorrectly represented on the five-verst maps. The scenery of the valley of the Uruch, which we afterwards descended, is varied and beautiful: the inhabitants are Ossetes; they are less gentlemanly in their dress, but more so in their behaviour, than our old friends of the same tribe. Perhaps the presence of a Cossack smoothed away many difficulties.

We rode down to Ardonsk, two stages from Vladikafkas, whence we drove back over the Dariel to Tiflis, where we arrived on the 26th August. We made our way back to Kutais, *viâ* Borjom and Achalzich. From the summit of the hills between the latter place and Kutais we took farewell of the

Caucasus. By a piece of wonderful luck no vapour blurred the view; the whole chain from some distance west of Elbruz to Kasbek on the east was before us; we could distinguish every glacier on its southern flank, and were able to confirm and rectify our impressions of the relative heights of its peaks.

We returned to England by the Crimea, Odessa, and St. Petersburg.

In conclusion, I wish briefly to notice two points which have been taken up by the press.

The first is the claim set up for its countrymen by the 'Allgemeine Zeitung' to the first ascents of Kasbek and Elbruz, which was thus translated in an English paper ('Pall Mall Gazette,' September 12th):—

"A German paper remarks:—'It is a mistake to suppose that these mountains were ascended for the first time by the three Englishmen. In 1829, Adolf Kupffer, the mineralogist, K. A. Meyer, the botanist, and other philosophers, were sent out on a scientific mission into the Caucasus by the Academy of Sciences at St. Petersburg, and ascended Elbruz with some Circassian guides. The history of this expedition is given in Kupffer's "Voyage dans les Environs du Mont Elbruz dans le Caucase, &c., &c., 1829;" "Rapport fait à l'Académie des Sciences à St. Petersburg, 1830;" and also in Klaproth's "Nouveau Journal Asiatic" for January 1831. As for Kasbek, it was ascended by the geographer Moritz Wagner, brother of Rudolf Wagner, about 1844.'"

The falsity of these statements is so easily proved by reference to the original accounts of the expeditions referred to, that I should not have considered them worthy of the attention of the Geographical Society had they not been republished in this country. Newspapers ought surely to be both ready and glad publicly to correct statements proved to be untrue, and calculated to throw discredit on their countrymen, which, in pardonable ignorance, they may have published. The editor of the paper in question does not consider this his duty; and although he thought our journey of sufficient interest to insert a long private letter of my own (sent to him by Mr. Gifford Palgrave), he refused to publish a contradiction of the supposed German ascents, coming from a well-known member of this Society. This contradiction has since been printed in an enlarged shape in the 'Alpine Journal.'

The second point is peculiarly geographical, and it is one on which, as a member of the outside public, I am most anxious to elicit the opinion of this Society. Having kept up a moderate acquaintance with the atlases and gazetteers of the day, which, as you know, state the frontier of Europe and Asia to run along

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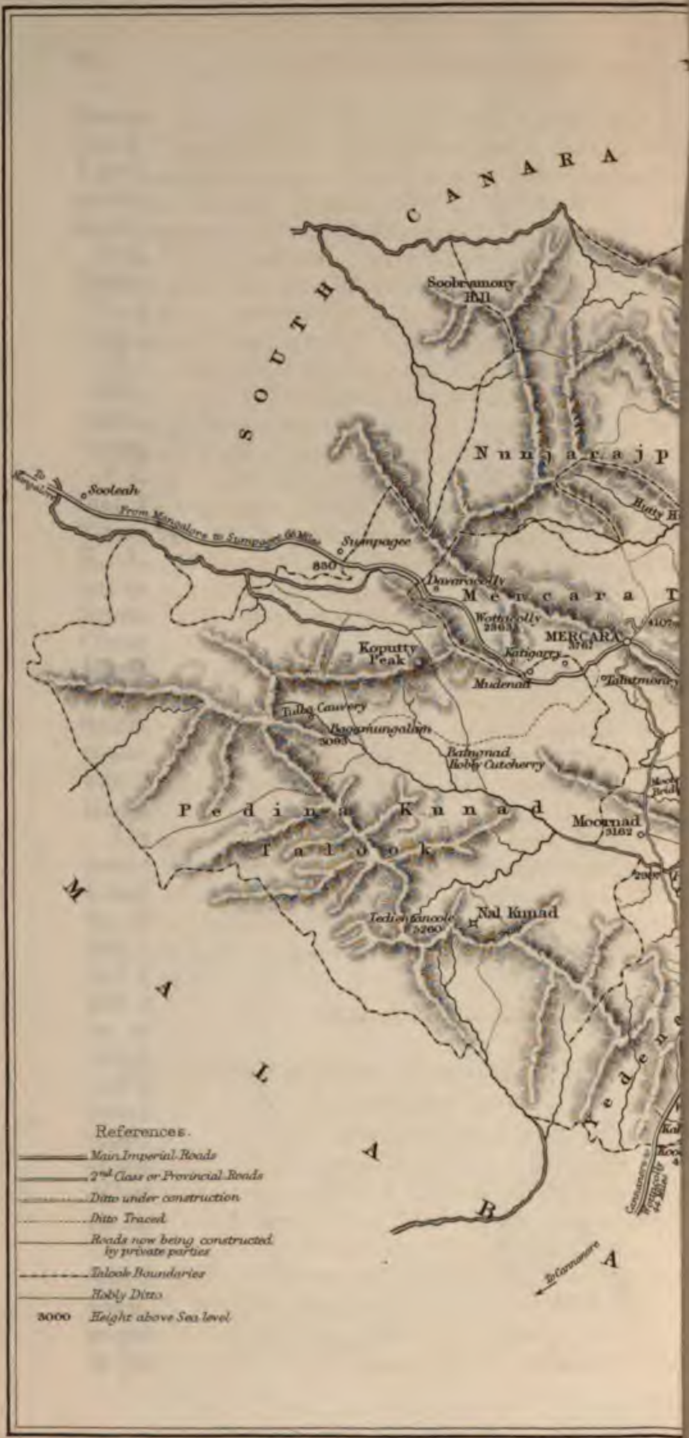

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the summit of the Caucasus, we ventured, on their authority, to remind the public that Kasbek and Elbruz, lying north of the Caucasian watershed, were as much in Europe as the Dom and Weisshorn are in Switzerland. On coming within reach of newspapers, we found that two gentlemen, "in common with many geographical friends," had "been much surprised" at the statement that the Caucasian watershed was the boundary of Europe, and had written to the 'Times' to protest against it, and to assert their belief that Kasbek and Elbruz were "mountains of the *southern* end of the Caucasus, which have always been considered by all geographers among the glories of Asia." This letter must have been somewhat hastily composed, since the answer to it from my friend Mr. Tuckett called forth a second, and more carefully written reply, in which our critics begin by admitting that they had accused us of going against "all geographers," knowing "MacCulloch, Blackie, Keith Johnston, Hall," &c., to be on our side. They went on to adduce a mass of evidence in support of the Don and Volga boundary, from geographers very respectable, no doubt, but mostly of a certain age.

In consequence of this controversy having been raised, the faith of the public in what I may almost call their geographical Bibles has been shaken, and the question is daily put, "Well, and where are those two mountains you went up?" I now ask you to enable me to answer it, and to inform inquirers whether they are justified in believing their atlases and gazetteers, or whether Europe and geography are to make a backward step to the frontier of the Don and Volga, or some other of those complicated and arbitrary lines of division which the latest authorities have, as it seems to me, wisely discarded in favour of the great partition wall built by Nature across the Caucasian isthmus.

IV.—*Effects of Forest Destruction in Coorg.* By GEORGE BIDIE, M.B., &c.

Read, January 25th, 1869.

COORG lies near the centre of the Western Ghâts, and chiefly on the eastern aspect of the range. On its western margin the crests of the chain rise up in bold peaked mountain masses, some of which attain the height of 5000 feet above the sea, and to the east of these the country consists of a series of low, long-backed hills, with intersecting deep-set valleys, running out towards, and gradually subsiding in, the table-land of Mysore. The province is chiefly drained by the Cauvery and its tributaries, but several large streams descending to the western coast of the peninsula also have their origin in it. The Cauvery rises far to the west, and for the first 10 miles or so of its course passes down the centre of a broad, flat-bottomed valley, surrounded on three of its sides by steep lofty hills. Contrary to what might have been expected, this large basin contains but little forest, so that the heavy rain-fall that descends on it must at once be precipitated into the river. The average elevation of Coorg is about 3000 feet above the sea, and at no distant date nearly the whole province appears to have been covered with forest. Towards the west, the remaining forest is, as a rule, dense and lofty; but at a distance of 10 miles from the crest of the ghâts it begins to get less so, and at 12 miles we enter the bamboo district, in which the trees are smaller and the jungle more open. The nature of the forest, and also the kinds of trees found in it, form pretty accurate indexes of the amount of rain-fall. Thus in the dense jungle tract, the annual fall varies from 120 to 150 inches, while in the bamboo district it ranges from 60 to 100 inches. As to the flora, the characteristic trees in the dense jungle are Michelia (*Chumpak*), Mesua (*Iron-wood*), Diospyros (*Ebony* and other species), Calophyllum angustifolium (*Poon spar*), Cedrela toona (*White cedar*), Chickrassia tubularis (*Red cedar*), Dipterocarpus, Garcinia, Artocarpus, Canarium strictum (*Black Dammer Tree*), Euonymus, Cinnamonum iners, Myristica, Myrtaceæ, Vaccinium, 'Melastomaceæ, three species of Rubus and a rose. In the shade of this forest there is a dense under-growth of moisture-loving plants, such as cardamom, canes, areca, plaintain, tree and other ferns, wild pepper and arums, and the boughs of many of the trees are covered with splendid orchids. The line that indicates the commencement of the bamboo district is marked by the absence of ferns, and the prevalence of a small shrub, Ardisia. The forest in it has a very characteristic appearance from the large clumps of bamboo that send up their feathery stems in all directions, and the most common trees are the Dalbergia latifolia (*Black wood*), Pterocarpus marsupium (*Kino tree*), Terminalia coriacea (*Mutti*), Lagerstromia parviflora (*Benteak*), Conocarpus latifolius (*Dindul*), Nauclea parviflora, Bassia latifolia, several Acacias, Butea frondosa; and in the eastern portion of the tract, Teak and Sandal-wood. This forest is not continuous, but interspersed with beautiful grassy glades, and in its shade the ground is covered with good pasture-grasses, and gay annuals spring up everywhere during the rains.

The rain in Coorg may be said to be derived entirely from the south-west monsoon—the showers at other seasons being few and light—and is chiefly deposited between the 1st of June and the end of September. During that period the heated plains of Central Asia cause a steady indraught of the south-east trade winds, rendered westerly by the diurnal rotation of the earth, and as these pass over an immense expanse of ocean ere they reach the land, they become heavily charged with moisture in their course. Shortly after quitting the sea, they encounter the western ghâts, standing right across their track, and drop upon them and the low country to the west of them, the greater portion of their watery freight. The chief cause of the precipitation is the reduction of temperature produced by the warm moist air coming in contact with the colder hills, and by the decrease in density that ensues as the current rolls up the mountain side. It will thus be seen that the rain-fall in Coorg depends entirely on its geographical position and geological conformation. In other words, it is so located that it is traversed by the south-west monsoon at the time when that wind is most densely charged with moisture, and so elevated as to obstruct its current and cause copious precipitation. Under such circumstances it can be of little consequence, as regards the rain-fall, whether the mountain slopes are bare or clothed with dense forest, as neither condition could have any appreciable influence on the amount of precipitation, or on the course or duration of the monsoon. I look, therefore, on the forests that grow on these high-lands as a consequence, and not the cause, of the rain; and this view is supported by the change that takes place in the nature of the forest as we proceed eastward from the crest of the ghâts and the rain-fall diminishes, the gradual diminution being easily accounted for on purely physical grounds. It does not appear therefore that the annual rain-fall in Coorg has or can be sensibly diminished by the destruction of forest which has taken place.* At the same time it must be stated that the Natives of the district complain that of late years their country has become hotter and drier from want of rain, and that rice crops have been diminished or lost from a failure of water in streams that used to run throughout the year. These changes they attribute to the cutting down of forest on coffee estates, and it will, therefore be necessary to enquire what effects the destruction of forests actually may have had on the climate and streams of the country. In so far as regards the rain-fall, the subject has been already discussed, so that it only remains to notice its bearing on other elements of climate and on the drainage.

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* It would have been well if this view could have been supported by records of the actual rain-fall during the last fifteen or twenty years, but unfortunately, prior to the beginning of 1863, no reliable observations appear to have been made. At present there are gauges at three stations, watched by careful observers, and the results, so far as communicated, are given in an Appendix.

It is only since the advent of the European planter, or during the last 12 years, that felling of forest to any considerable extent has taken place in Coorg, and as the clearing has progressed in annual instalments of comparatively small extent, the results have crept on gradually, so as to render them much less obvious than if the entire extent had been cleared in a single season. There can be no doubt, too, that the evil influences called forth by forest destruction do not attain their full force immediately, but go on increasing from year to year until they acquire a most disastrous power. The total area of land denuded of forest in Coorg to make way for coffee amounts to about 20,000 acres,* and the clearings have mostly been made in the dense jungle tract, although a good many estates have of late years been opened out in the bamboo district. The spots that have been selected as sites for estates are chiefly situated on the flanks and crests of low hills, the sides and bottoms of ravines, and the slopes and passes running down on the western side of the ghâts to the low country. Such localities, as a rule, are densely wooded, and being well supplied with springs, give rise to numerous small streams. In fact, they may be looked upon as the fountains of the river system of the country. The question then arises—to what extent are springs and streams in such situations dependent on the forest for their supply of water, and what will be the effect on them of its removal? It is, perhaps, hardly necessary to say that springs and small streams are fed by the water stored up in the earth during the rainy season. As the rain descends on natural forest, it is conveyed in various directions by the leaves towards the ground, and on reaching this prevented from running rapidly off by the dense undergrowth of shrubs and herbaceous plants, and a carpet of dead leaves. Below this it encounters a layer of vegetable mould, which, having a great affinity for moisture, absorbs it like a sponge. As soon as the humus is fully saturated, it passes on what water may subsequently fall to the subjacent mineral earth, and this process of percolation is in various ways aided by roots which descend to great depths, perforating the densest subsoil, and even forming passages in rock. The quantity of water thus transferred to the depths of the earth and the reservoirs of springs is enormous, and when the dry season arrives, the forest again plays an important part by husbanding and giving off gradually the subterranean supplies. The means by which these beneficial influences are exerted are various and interesting. As the water rises to the surface, it is, as in the case of its descent, again partially retarded by the layer of humus, and, having passed through that, so obstructed by various mechanical obstacles, that it does not readily acquire the volume of a stream, and so pass quickly away. The way in which the soil is matted together by roots in forests also renders it very difficult for a small stream to cut out a channel; and when such has been formed, it is in general so tortuous, and the current so slow, that it must lose a considerable amount of water by percolation. At the same time, the shade of forest greatly restrains evaporation, and although the quantity of water taken up and exhaled by trees is very great, a portion of it is returned as dew or fog, and what is wafted away is fully compensated for by other advantages resulting from the presence of forest. The influence of shade in modifying evaporation is well illustrated by what happens in the coffee districts after the April showers which herald the advent of the south-west monsoon. On an estate freely exposed a day or two of sunshine after a heavy fall will have rendered the soil quite dry and hard again, whereas on an estate under forest shade the ground will continue damp for a week or more. Although their insignificance might lead to their being overlooked, there can be no doubt that the mosses, lichens, and succulent herbaceous plants, which abound in tropical forests, are also of considerable benefit in retaining moisture, as, during rain, they absorb water like a sponge, and part with it again very slowly. It would, therefore, appear that there are numerous agents and conditions in natural forests favourable to the production and permanence of springs and streams, which are not to be found in open ground, originally so or denuded of its trees by man. During the whole of my tour in Coorg and Mysore, I have endeavoured to collect information bearing on this important question, and the facts thus elicited on the whole go to prove that tropical forest is the *alma mater* of springs and streams. Various instances have been brought to my notice of springs and small streams having become quite dry since the forest was cleared away in their neighbourhood, while in numerous cases those that used to be perennial only contain water now during, and for a short period after, the monsoon. Similar results have been found to follow the destruction of forest growing near the sources of streams in all parts of the world. Thus Palestine and other eastern countries have been rendered desolate by the destruction of the forests that existed in them when they were so famous for their beauty and fertility, and in modern times many districts in France and America have had their water-supply diminished, and fertile land converted into arid wastes by the clearing away of woods around the head waters of streams.* In a recent Mauritius paper, it was stated that the culture of the sugar-cane had of late become so precarious in the island, owing to the excessive dryness of the air and soil, consequent on the cutting down of forests, that the Government had considered it desirable to appoint a Commission to investigate the matter and suggest some remedy. For some years, too, the nutmeg-trees in Singapore have been dying, and so extensive, obstinate, and fatal has been the "blight," that at the present day not one of the numerous plantations there is considered worth the expense of cultivation. A most graphic account of the disaster will be found in Cameron's 'Malayan India,' and judging from the information there given as to the cutting down of forest to make way for the nutmeg, and the manner in which the trees died, there seems every reason to believe that their death was accelerated, if not entirely induced, by the reduction of humidity resulting from extensive clearing.

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* This represents the total acreage according to returns from individual planters.

The next points that require to be considered in connexion with forest clearance are its effects on the drainage of the denuded district, and the results that these in their turn induce. When land is being cleared for coffee culture, the woods and their under-growth are cut down and burned; and during the conflagration, not only is the ground deprived of its carpet of vegetation, but a portion of the humus consumed, and the remainder so dried that it is liable to be washed away. When rain falls on such ground, instead of being delayed and gradually conveyed into the soil, it at once rushes down the bare slopes, enters the nearest nullah, and is rapidly carried out of the district. At the same time a certain portion of the surface soil is carried away, the conservative agencies of the forest being no longer in existence. The effects of this degrading process, continued through a series of years, may be well seen on the crests and slopes of some of the lower hills in Coorg, in what is called grass or *banay* land. In such situations nothing is left but the barren, stony subsoil, covered by a coarse grass, or bearing a few stunted shrubs of some hardy description. The most striking results of clearing, however, are the channels cut out in new situations by the rain water as it seeks a lower level, and the landslips caused by percolation behind banks of earth, which have no longer the binding influence of tree-roots to keep them in position. The *nullahs*, too, or natural watercourses, which used to be sufficient to carry off the surplus water, are no longer so, and an impetuous torrent dashes down them, eroding their banks and carrying along with it not only earth, but stones often of considerable size. These results were very forcibly pointed out by Major Sankey in his Report on the Public Works in Coorg for the official year 1865-66, in which he shows that great damage has of late years been done to roads and bridges in the Province by the floods resulting from forest clearance. This Report drew the attention of the Right Hon. the Secretary of State for India to the subject, and in July, 1866, he forwarded a despatch to the Government of India, which induced them to suggest to the Madras Government the necessity for a further inquiry into the effects of these freshets, and thereupon they requested the opinion of Dr. Cleghorn, the Conservator of Forests, on the subject. Accordingly, in August 1867, when the monsoon was in full force, he proceeded to examine the Cauvery, which, as already stated, drains the greater portion of Coorg. The point of observation was the junction of the Cauvery and Bhowani Rivers, but no trace of unusual flood could be detected there; and Dr. Cleghorn also states in his Report on the subject, that the water returns for twenty years from the Tanjore district, which is irrigated by the Cauvery, do not show any material alteration in volume. Dr. Cleghorn's most interesting Report was published in Proceedings of Madras Government, Revenue Department, dated 23rd September, 1867; and since the commencement of this inquiry, it has been repeatedly brought to my notice as being opposed to Major Sankey's views, and the theory in general of floods in rivers being a result of destruction of forest. A brief explanation, however, will, I think, show that Dr. Cleghorn's observations do not in the slightest degree affect the question at issue. Before the Cauvery reaches the place where it was watched by him, it receives numerous tributaries from other districts, which swell it to such a size as would render any increase of water from Coorg hardly appreciable; and it is also between Coorg and Coimbatore frequently tapped by irrigation canals, which have a considerable modifying influence on the volume of rivers. It is also worthy of notice that the forest immediately on the banks of the Cauvery, while it runs in Coorg, remains almost intact, and that the drainage of a large extent of the cleared land does not flow into it, but is carried off by streams running to the western coast of the peninsula. The effects, therefore, of forest destruction in Coorg, as regards floods, would be chiefly local, and most apparent in the very spots where they were noticed by Major Sankey, viz., along the course of tributaries of the Cauvery and of other streams arising in, or passing through, denuded tracts of land. At the same time, there can be no doubt that, if the clearing is greatly extended, its effects will ultimately become apparent in rivers far beyond the limits of the province.

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* See 'Brown's Forester,' p. 13, 3rd edition, 1861, and 'Man and Nature,' by Marsh, pp. 197–210, &c., 1864.

The effects of forest clearance on various climatic phenomena are also of great interest and importance, and I shall now briefly consider its influence:—

A.—On composition of air.
B.—On temperature of air.
C.—On humidity of air.

Before entering on these topics, it may be as well to premise that here again the results of the denudation will be chiefly local; for although the air that yields its carbon may come from afar, and the oxygen made in this great forest laboratory may be carried to a great distance, still these changes must, under present circumstances, be to the atmospheric sea of the peninsula but as those effected by a small river of water in the Indian Ocean. In the same manner changes in the moisture or temperature of the air can hardly extend to any great distance from the site of the clearing.

A.—INFLUENCE OF FOREST CLEARANCE ON THE COMPOSITION OF THE AIR.

Although opinions differ as to the whole of the changes produced in air by living plants, still all agree that they are the chief agents in keeping up the supply of oxygen, which, amongst other useful operations, supports the process of decay in organic substances, whereby their constituents are utilised in the economy of nature, and produces those beneficial changes in the soil which follow digging or ploughing. Trees also absorb various gases generated during combustion and decay, and so at the same time purify the air, and increase their own vigour and substance. Their influence with respect to malaria is also very considerable. If this subtle atmospheric element arises from a marsh fed by the ooze from neighbouring forest, or from the decaying vegetable matter in forest shade, the cutting down of the trees may bring about a beneficial change. In some cases the first effect of the clearing is to increase the malaria, the processes that caused its evolution being apparently stimulated thereby; but as the marsh becomes dry ground, and the vegetable matter is converted into humus and covered with grass, the neighbourhood becomes much healthier. In the case of drifting malaria again, trees growing between its source and human habitations act as a screen, arresting its progress mechanically, and probably also decomposing it to some extent.

On the whole, as regards malaria, the climate of Coorg does not appear to have been changed for the better or worse by the destruction of forest in the province.

B.—EFFECTS OF CLEARING ON THE TEMPERATURE OF THE AIR AND GROUND.

One has only to pass during the heat of the day from a clearing in Coorg into the nearest forest to be sensible of a great change in temperature, and although the cool sensation thus experienced is greatly owing to the leafy screen keeping out the direct rays of the sun, still it is well known that the temperature of the air in forest is lower and more equable than in clearings. In Singapore, "by resorting to the neighbourhood of the jungle, a degree at least of reduction in temperature may be secured." During the night there "soft land airs" breathe *from out the jungle*, and "to these land winds is due, in a great measure, the coolness of the nights, which will generally admit of good sound slumber."* The exact frigorific influence of forest in the tropics does not appear to have been much inquired into, and it is therefore very desirable that careful observations should be instituted, so as to afford reliable data. As regards the temperature of the ground, the mean temperature of forest land in the tropics has been ascertained to be nearly 2° Fahrenheit lower than that of clearings. It is interesting to note that these statements are supported by the nature of the flora that springs up in neglected clearings in Coorg, the plants being entirely such as grow in hot dry situations. Forest reduces the temperature of the air in various ways, but chiefly by transpiration, heat being rendered latent when the fluid taken up from the ground is passing into the state of vapour. The amount of water exhaled in this way is enormous, a sunflower having been found to give off from 20 to 30 ounces daily. The moist state of the ground in forest shade must also cause some reduction in temperature, while the radiation that goes on from the leaves will, during a portion of the twenty-four hours, render them frigorific agents. Trees, as mechanical agents, keep the ground from being heated, and greatly prevent aërial currents, which, in the open, produce sudden and notable changes in the temperature. Judging from its effects on the original flora of the province, there is good reason for saying that the local climate in various parts of Coorg has been rendered both hotter and drier by the destruction of forest. Thus various instances were brought to my notice of jungle-trees of the hardiest description having perished in the neighbourhood of clearings, and no other cause could be discovered for their death beyond the obvious and popular one of change of climate. I have observed, too, that for some distance around denuded tracts, delicate ferns and flowering herbaceous plants gradually disappear.

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* Cameron's 'Our Tropical Possessions in Malayan India,' p. 153.

C.—EFFECTS OF CLEARING ON THE HUMIDITY OF THE AIR AND SOIL.

Although a tree under certain conditions will absorb moisture from the air, still the amount thus withdrawn is as nothing compared with what it gives off by transpiration. By a beneficent arrangement, too, the amount of exhalation increases, within certain limits, in exact ratio with the heat and dryness of the air, and thus the severity of the hot season is partially mitigated. Plants in the immediate neighbourhood of forest, even although enjoying no shade, show by the colour and luxuriance of their leaves, that they are living in moister earth and air than those at a distance. As regards the soil, it is always very much damper in forest than in open ground; and this fact has been frequently brought to my notice by European and Native planters, as indicative of the value of shade in coffee culture. It is unnecessary to enter into the reason for this, as it will be sufficiently obvious from what has been already said in a former paragraph of this paper. Forests are of great benefit to cultivated plants in their neighbourhood by promoting the deposition of dew, and causing fog. They also obstruct the passage of drifting fogs, and so make them part with some of their moisture; and when a dry scorching wind sweeps over a damp wood, it is moistened, and rendered much less hurtful to vegetation. Again, when a cultivated valley lies at the base of a forest-clad hill, the moist stratum of air above the trees rolls down the slopes to it in calm nights, covering each leaf and blossom with copious dew. So far as ascertained facts enable us to judge, there are no grounds for believing that the forests on the Western Ghâts ever induce showers. At the same time, many in the coffee districts believe that they have a considerable influence over the partial showers that fall now and again during the dry season, and it is better, perhaps, that the question should remain an open one, until further observations shall have thrown more light on the subject. That the cutting down of forests in Coorg has rendered both the earth and air there drier, is clearly shown by perennial streams having become periodical, by many plants perishing that used to flourish during the dry season, and by other remarkable changes in natural phenomena.

Having thus discussed the changes in climate caused by forest clearance, it may be well to notice briefly its effects on animal and vegetable life.

EFFECTS OF FOREST DESTRUCTION ON ANIMAL LIFE.

It is not my intention to enter fully into its effects on man, but it may be remarked that the food supplies of the natives of Coorg may have been reduced by the departure of large game from the want of cover, and by a decrease in the rice crops from diminution in the water-supply. As regards animal life in general, we know that in the natural forest there is a balance maintained between creatures that are harmless or useful and those that are hurtful. Thus the large carnivora keep in check bison, deer, &c., and the smaller ones hares, rats, &c., while small quadrupeds, birds, and snakes, directly or indirectly, prevent the undue increase of insects. These last are, of all the inhabitants of the forest, the most destructive when they become numerous, although, when kept within due bounds, very useful in getting rid of decaying organic matter, &c. In the natural forest insects rarely multiply to such an extent as to become destructive to trees or to the cultivated plants in the neighbourhood; but when clearings are made, noxious species often appear in such numbers as to become a pest. The chief causes of the increase are the diminution of their enemies, the establishment of climatic and other conditions favourable to their production, and the absence of the plants on which they used to live. In Coorg the appearance of the "coffee borer" in such hordes would seem to depend, to some extent, on the extensive clearings that have been made. Residents there have told me, too, that several birds and a *gecko* belonging to the fauna of Mysore have made their appearance in the province of late years, and at the same time various species of indigenous birds, which live in sparse jungle or open country, have become more numerous. The kinds that have multiplied most are chiefly insectivorous, such as the *mina*; and in this we see a beneficent arrangement on the part of nature to keep in check those enemies of vegetation, which climatic and other changes have called forth in devastating hosts.

EFFECTS OF FOREST DESTRUCTION ON VEGETATION.

These have been partly noticed in discussing the effects on climate. The most remarkable change has been the increase in species that formerly grew only in hot and barren situations in the province. Thus we have in clearings several kinds of Ficus, 2 Macarangas, Sponia Wightii (charcoal tree), 2 Solanums, Clerodendron infortunatum, Callicarpa cana, several grasses, &c., all naturally inhabitants of pasture-land. At the same time, several moisture-loving plants, such as Ferns, Aroideæ, Canes, wild Plantain, Cardamom, &c., have become much less common, or disappeared in various tracts. The Solanum rubrum, probably an importation from Mysore, has become common in some places, and, but that its fruit is eagerly eaten by the *mina* and other birds, would soon be a most troublesome weed. An exotic, the Physalis peruviana, which must have escaped from some garden, has also increased in a wonderful manner, growing spontaneously in clearings all over the country. The plant that has been most influenced, however, by forest destruction, is the "white weed," or Ageratum cordifolium. This weed pursues the footsteps of the planter wherever he goes, springing up as if by miracle all over his clearings, robbing the soil of its most valuable constituents, and refusing to be exterminated.

The economic value of forest, perhaps, hardly lies within the scope of this Report; but I may be allowed to remark that the demand for wood is so steadily on the increase, that in a few years supplies will have to be drawn from remote districts, which as yet have hardly heard the sound of the axe. As the reserves of timber-trees now in favour decrease, too, doubtless substitutes for them will be eagerly sought after, and thus a good deal of what is termed "jungle-wood" may ultimately become of considerable value. It seems highly desirable, therefore, that forests containing trees of recognised or probable utility, should be preserved to meet the wants of the future, and that the State should be the owner of such reserves, as their safety can never be depended on when they pass into private hands. This would not prevent their being rented out for the culture of cardamoms or of coffee under shade.

It now remains to offer some remarks regarding the amount and locality of tracts of forest that should be preserved to save the climate from further deterioration, regulate the drainage, and maintain the famed fertility of Coorg. Running a line from Mercara in the north by Moornad, and due south until it touches the crest of the ghâts, we have to the west of this a large and well-defined basin, in which the Cauvery and some of its tributaries arise. Only a very few clearings have been made in this tract, and the land, as a rule, is in the hands of the Coorgs, who seem anxious that the standing forest, of which there is a great deal, should be left untouched, and the district kept sacred to them and their descendants. One can sympathise with them in these wishes; and for other substantial reasons, I would strongly recommend that forest destruction should be strictly prohibited in this quarter. Again, from the ford on the Cauvery at Moornad down to Fraserpett it seems desirable that a belt of jungle, at least 50 yards wide, should be kept intact on each bank of the river. Forest on the crests or slopes of hills in which important streams arise should als be carefully preserved, and the banks of streams should always, to the distance of 20 or 30 yards on each side, be left under wood, as its presence serves to keep up the water-supply in the dry season, and to prevent floods in the rains. Although of less importance, too, there seems no doubt that trees on the banks of streams, to a certain extent, encourage the increase of fish. As a rule, forest growing on the eastern or western slopes of the immediate crests of the ghâts should also be preserved, as precipitation is greatest in such situations, and denudation sure to cause floods, and induce in a marked degree other bad effects. The slopes of hills having a south-west exposure should also be kept under forest, as they are comparatively worthless for the culture of coffee or any other plant, the south-west monsoon destroying everything directly exposed to its force. Any one who has not been on the ghâts during the monsoon can hardly form an idea of its violence: not only is coffee injured or killed by the wind, but in exposed situations young plants newly put down have been swept away by the torrents of water running down the bare hill-sides. The importance of belts of jungle being maintained along the sides of public roads, so as to prevent landslips, &c., having already been recognised by Government, does not require any further notice here. Before giving off land in future for clearing, it would be well to submit it to a careful inspection, so as to ascertain whether any portions of it would be unfit for the growth of the plant which it is proposed to cultivate, and the forests on unsuitable parts should then be kept standing. One would think that self-interest would prevent landowners from trying to cultivate such spots, but many proofs to the contrary might be brought forward. At the same time, it could be seen whether the proposed clearing would be likely to produce floods that might prove dangerous to public works, and action taken accordingly. The rice lands in Coorg are very peculiar, being long, narrow, winding patches, surrounded by low forest-clad hills, from which they derive their water-supply. It would manifestly, therefore, be imprudent to cut down any forest in their neighbourhood. Forest in the upper end of ravines should also be preserved, as it invariably gives birth to springs and streams.

APPENDIX.

Coorg.—Mercara Rainfall and Temperature.

	1863.		1864.		1865.		1866.		1867.		1868.		1866.	1867.	1866.	1867.
	Rainfall.	Mean temperature.	Rainfall.	Mean temperature.	Rainfall.	Mean temperature.	Rainfall.	Mean temperature.	Rainfall.	Mean temperature.	Rainfall.	Mean temperature.	* Rainfall at Kembukollie.		* Rainfall at Yemmegoondi.	
January ..	0·	65°	0·	66°	0·0	No record.	0·0	65°	0·0	64°	133	66°	..	..	..	..
February ..	0·	66°	0·	67°	0·0		0·0	67°	0·0	70°	..	..	..	..	..	..
March ..	0·45	67°	0·	71°	1·23		0·0	69°	3·70	71°	..	..	..	2·04	..	1·46
April	1·25	67°	1·52	73°	2·50		1·63	71°	1·46	70°	..	..	..	2·72	..	2·14
May	2·30	67°	4·72	No record.	9·33		2·41	72°	8·56	71°	..	..	..	2·69	..	1·40
June	44·78	67°	24·79		21·17		38·59	67°	19·89	67°	..	..	19·57	11·99	23·53	10·99
July	31·74	67°	74·40		64·82		23·52	65°	37·47	66°	..	..	13·67	18·64	15·09	15·90
August ..	29·46	67°	19·0		36·91		17·66	66°	19·80	68°	..	..	10·36	4·81	9·74	6·23
September ..	12·95	67°	11·22		9·08		9·14	66°	14·02	65°	..	..	6·98	4·31	5·47	4·81
October ..	10·08	67°	3·35		2·84		14·68	64°	6·07	69°	..	..	8·44	6·18	7·76	5·67
November ..	0·98	68°	0·98		2·28		0·13	66°	0·03	66°	..	..	·33	·05	·10	..
December ..	1·40	65°	1·40		0·0		2·28	65°	0·0	65°	..	..	·97	..	1·02	..
Total ..	135·39	66°6′	141·38	..	150·16	..	110·04	65°25′	111·00	67°6′	..	..	60·42	53·43	62·71	48·60

* These two stations are in South Coorg, about 8 miles east of Verajendrapetta and in the Bamboo District.

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Ross in 1839-43, in which the Author took a
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emorable one of Sir James Clark Ross in 1839-43, in which the Author
art. The result of this *résumé* is embodied in the accompanying map.

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V.—*On Antarctic Discovery and its connection with the Transit of Venus in* 1882.* By J. E. DAVIS, Staff-Commander R.N., F.R.G.S.

Read, February 22, 1869.

I NEED scarcely remark that the object to be gained by observing the transit of Venus over the sun's disk is the ascertainment, to be deduced therefrom, of the distance of the sun from the earth, the sun being at present three or four millions of miles out of her (or our) reckoning, the calculations at present differing to that extent. The most simple mode of explaining the process by which this is accomplished, is by stating that all that is required for the calculation is the exact angle subtended by the radius of the earth from the sun, and as we cannot get to the sun to measure that angle, it must of necessity be done from the earth, and that by means of parallax, or the apparent change in the position of the sun by a change of position on either side of the earth's centre, and as the amount of the sun's parallax in dispute (causing this three to four millions of miles error) is but little more than the third of a second of arc, it may be imagined (or to the uninitiated it cannot be imagined) what figures and quantities have to be dealt with.

There are other methods by which the sun's distance may be ascertained; but astronomers assure us that the best is that by the transit of Venus across the sun's disk, observed from widely different and opposite parts of the globe, at the moment of the ingress and egress, and as these transits occur only at intervals of 100 years (when two take place in 8 years), it is necessary, *if* they are to be observed, to "make hay while the sun shines." One occurred in 1761, and the last in 1769; the next will take place in 1874, and the one in connection with my subject in 1882.

It is very easy to understand that if the ingress or egress of the planet be observed from points of the meridian on either side of the centre of the illuminated portion of the earth, the moment of contact will be accelerated in the one case and retarded in the other; and that this acceleration and retardation would increase in ratio to the distances of the points of observation, being greatest at spots most divergent from the centre of the illuminated arc, or where the sun is on the horizon; but as it is not possible to observe the transit from those positions, one as near to it as possible must be obtained. Thus, in the diagrams,* the lower line represents the extreme sides, with the sun on the horizon, at which the acceleration and retardation are greatest, and the semicircles the decrease towards the centre, each tenth or factor being equidistant, treating the earth as a plane instead of a sphere. The dotted lines are the parallels of latitude and the hourly meridians of longitude.

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* The first part of this paper consisted of a careful *resumé* of the voyages and discoveries in the South Polar regions, from that of Dirk Gerritz in 1599 to those memorable ones of Sir James Clark Ross in 1839-43, in which the Author took a part. The result of this *resumé* is embodied in the accompanying map.

There are two methods by which this transit can be effectually observed:—1st. By absolute longitudes from four stations, viz., one for acceleration by parallax, and one for retardation for the ingress, and the same for the egress; for, as the planet takes about six hours to cross the sun's disk, there are but few places from which both the ingress and egress can be observed (having due consideration for parallactic value), and it is when this is the case that this method is applicable, and for which accurate determinations of longitude are necessary; an error of *one* second in time would vitiate the result.

The other method is by observing both ingress and egress from two stations—one for acceleration by parallax, the other for retardation; and the great advantage of this method over the other being that the accurate determination of longitude is not an absolute necessity. In the transit of Venus in 1882 one such station is to be found in the North American colonies, and the other can only be obtained in a high southern latitude, to which this paper refers. In the diagrams the horizontal lines denote the elevation or altitude of the sun and the semicircles the relative value of a station parallactically, and this value is denoted by factors, of which 1·0 represents the point of greatest value, and the decimals the lessening value—the highest altitude of the sun and the highest factor being the best position for observing the transit. Thus the normal point is useless, the sun being on the horizon, and at Cape Town the parallactic value is too small. At Kerguelen's Island the altitude of the sun at the ingress will be about 12°, while the parallactic value is large (about 0·97), at Crozet's, altitude 24°, parallactic value 0·9, both very good stations, but another element has to be considered, viz., Meteorology; and these stations with those in other localities, as the Mauritius and islands near, are only adapted for the first method, and dependent on absolute longitude, but if a suitable position can be found on the high southern land, the second method can be adopted; and for this purpose the Astronomer Royal has suggested two points—one near Sabrina Land, in 7 hours East longitude, where the ingress and egress could be observed on either side of the nether pole, at an altitude

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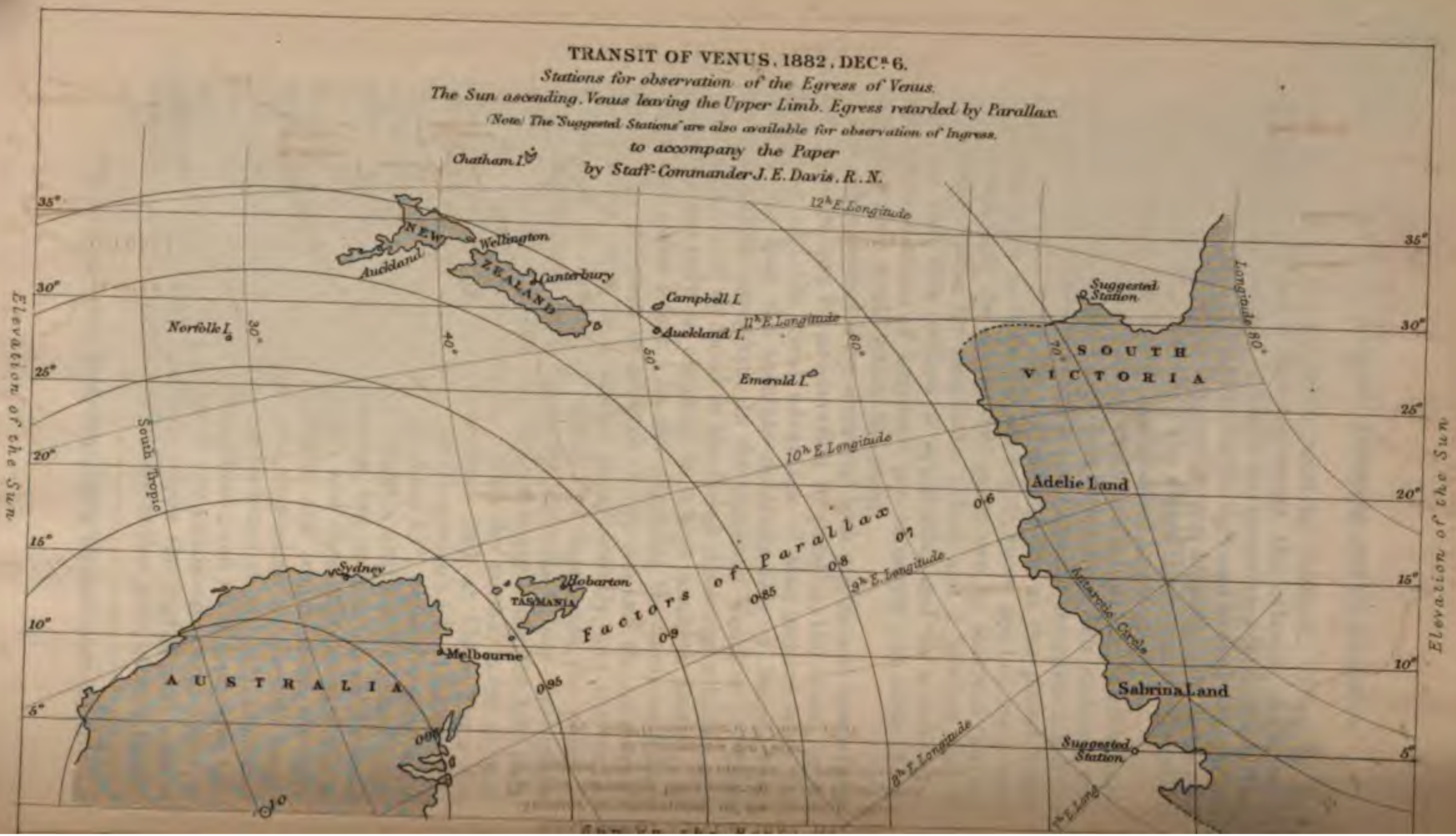
* These diagrams were kindly furnished by the Astronomer Royal.



TRANSIT OF VENUS, 1882, DEC.R 6.

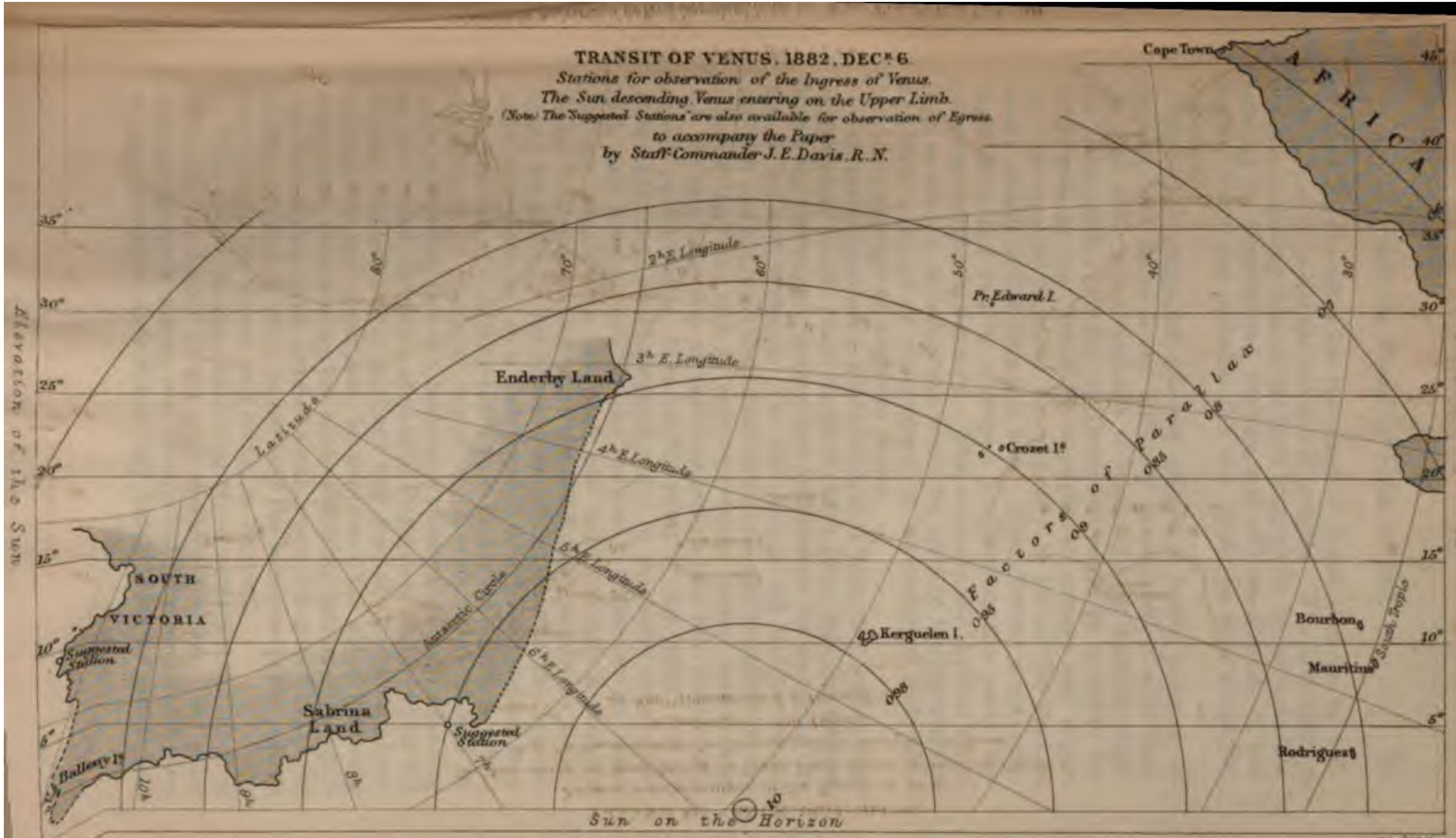
Stations for observation of the Egress of Venus.

The Sun ascending. Venus leaving the Upper Limb. Egress retarded by Parallax.

(Note) The "Suggested Stations" are also available for observation of Ingress.

to accompany the Paper

by Staff-Commander J. E. Davis, R. N.



TRANSIT OF VENUS, 1882, DECR 6.

Stations for observation of the Ingress of Venus.
The Sun descending, Venus entering on the Upper Limb.
(Note) The "Suggested Stations" are also available for observation of Egress.
to accompany the Paper
by Staff-Commander J. E. Davis, R.N.

Published for the Journal of the Royal Geographical Society, by J. Murray, Albemarle Street, London, 1869.

of about 5°, the other on the coast of South Victoria, in latitude 72°, or in a higher latitude if possible. The first position is not a promising one, as the high land would be immediately between the observer and the sun, and with an altitude of less than 5° it is not probable the sun would be seen above the mountains.

The other suggested position affords a better prospect of success; still there is one difficulty in connection with that, viz., the utter impracticability of reaching it in time to make the observation: the 6th of December would be a month too early, and, as time would be requisite to arrange and adjust the instruments, it would be necessary to be on the spot at least a month earlier than that date. This difficulty is not insurmountable, and can be overcome by landing the party the previous summer in January. This necessity would prove beneficial to science, as advantage would be taken of the opportunity to obtain a series of observations in meteorology and other branches, through an antarctic winter.

The *modus operandi* I would suggest is, that two vessels with steam-power should leave England about June, 1881, having on board the equipment, in men and instruments, for observing the transit by both methods. On the passage out the parties for the first method, with their instruments, should be landed on the selected stations, and at once commence moon observations for the determination of the longitude, while the vessels proceeded to Hobarton, from which place, in the latter end of December, they would proceed south in longitude about 165° east, and keeping well to the westward, endeavour to make Balleny islands, take the pack and work through it towards South Victoria, and then skirt the coast along as closely as possible; for although Sir James Ross did not observe the appearance of a harbour, it is just possible a different season may open one up. Proceeding south past Possession island, a careful examination of Coulman island, in latitude 73¾°, should be made, and failing to find a harbour or suitable position for landing on that island, to return at once to Possession island (where Sir James Ross effected a landing) and land the party with huts, instruments, and provisions, for two years, the ships returning north, and, after visiting the other observing parties and supplying their wants, again proceed south, about the same time as the previous year, and after embarking the southern party, return and pick up the others, and return to England.

With regard to the meteorological element alluded to, it is decidedly in favour of the high southern position. All polar voyagers agree in stating that there is but little medium weather in high latitudes; it is either very bad or very delightful, and pretty evenly balanced. When fine, it is the perfection of fine weather, with an atmosphere so clear that mountains 80 or 100 miles distant would readily be believed to be not more than 20. On the contrary, when the weather is bad, it is very bad, and nothing to be seen; so that the chances of obtaining the observation, or not, are about equal.—Not so at Kerguelen or Crozet islands: such navigators as have passed them have generally found them wrapped in a mantle of mist, and although it is scarcely fair to draw conclusions from a winter residence, still between two and three months' sojourn at Kerguelen's, have left vivid recollections of the humidity of the atmosphere and the variableness of the climate.

Of the value to be attached to the observation of this transit, astronomers can best testify; and the testimony of the illustrious Halley, as quoted by the Astronomer Royal, is thus rendered from the Latin:—

"And heartily could I wish observations of this phenomenon to be made by several in divers localities (as much for the establishment of a firmer belief through a general agreement, as lest a single observer should be frustrated by intervening clouds) of such a spectacle as I know not that men of this or the following age will again see, and upon which depends the certain and satisfactory solution of a most remarkable and otherwise insolvable problem. And to such subtle examiners of the heavenly bodies, after our decease, are these *observanda* committed. Again and again do we commend to them that, encouraged by the memory of this work of ours, they should strenuously, even with their whole powers, apply themselves to the thorough fulfilment of the observation, and for them we devoutly pray and wish all propitious circumstances; above all, that they may not be deprived of their most anxiously desired view by an inopportune obscuration from a clouded sky, and that, finally, the discovery of the magnitudes comprised within the narrower limits may redound to their lasting honour and glory."

If this great national work, of which we are to be so proud—this remarkable and otherwise insolvable problem—is to be accomplished, those that are to be instrumental in its accomplishment must go to school at once, and *that school* is the *North.* Sir James Ross, without his previous experience obtained in the north, would not have been so successful in the south. In 1881 we shall no doubt, as now, have plenty of good men and true ready and willing to go; but it is no reflection on them to say that, without previous experience in ice-navigation, the voyage would prove a failure; and now that North Polar research is revived, and foreigners are straining every nerve to reach the pole (a gallant Swede has taken his

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C. Mendocino
Mattole R.
Mt. Pierce
Weaverv.
Mt. Balley
Brigham C.
SALT LAKE CITY
Shelter Cove
Yallabal
Ft. Wright
Utah L.
Provo
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Noyo
Mendocino City
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ship to a higher latitude than any ship has previously been—treading on the very heels of Parry—and an American has trod on more northern land), is England not to make an effort to hold her own? It is to be hoped that we shall soon see an expedition afoot—whether to Smith Sound or the Spitzbergen Strait it matters not, although, for the educational purpose alluded to, the latter is the best. Shame will be on us if a foreigner should step in and carry off our Polar honours; that even in this utilitarian age we shall find some men in power who do not consider it money thrown away to advance geographical knowledge and add to scientific research, and who will advocate the cause of Polar discovery and enable us to keep up our breed of Polar men, who add so much to the peaceful honours of our country.

That this great problem of the age may be solved, and that by Englishmen, is the heartfelt wish of every astronomer and geographer; and indeed every true Englishman would well be proud of a success which would redound so much to the honour of his country.

VI.—*On the Basin of Colorado and the Great Basin of North America.* By W. A. Bell, M.A., M.B.

Read, March 8, 1868.

In the spring of 1867 a very extensive surveying expedition was organised by the Kansas Pacific Railway Company of North America, in order to determine upon the best route for a Southern Railway to the Pacific coast through Kansas, Colorado, New Mexico, Arizona, and the southern part of California.

Until the Rio Grande (about equi-distant from the Mississippi and the Pacific) had been reached, three separate surveying parties only were required, but *west* of that river, across the regions of which the present paper treats, no less than five distinct parties, each capable of making an accurate instrumental survey for a railway, crossed the continent by different routes, on different parallels of latitude.

As my office in the expedition did not necessitate my taking any part in the surveys, or remaining permanently attached to any one party, I was enabled to travel over much of the country lying between the 33rd and 31st parallels of latitude in New Mexico and Arizona, and to recross the Great Basin and the Rio Colorado Basin, a second time about the 41st parallel. Others of our parties examined the country lying between the 34th and 35th parallels, and the information obtained from them, as well as that furnished by Lieutenant Ives, in his exploration of the navigable portion of the Rio Colorado, has been made use of, so as to give a sketch of the entire region.

That part of the territory of the United States which lies between the Rocky Mountains and the Sierra Nevada of California is composed of three river-basins:—

	Square Miles.
The basin of the Columbia River, which has an area of about	230,000
That of the Colorado	200,000
„ „ Great Basin	280,000

For the sake of comparison:—

The area of France is	210,000
That of the Mississippi River Basin	1,400,000
That of the Rio Grande del Norte Basin	210,000

As we did not enter the basin of the Columbia River whilst traversing the far west, I shall confine my observations exclusively to the other two sections of country, only remarking here that the "*divide*," which separates the Columbian basin from the great basin system passes from the southern extremity of the Blue Mountains of Oregon, in a south-westerly direction, into the Sierra Nevada system, about latitude 42°, and in a south-easterly direction almost to the great bend of Humboldt River; thence it passes a little northward again, as the ranges north of the basin indicate, between that river and the Snake, until it enters the northern extremity of the Wahsatch Mountains. From the northern extremity of these Wahsatch Mountains a short range, named the Bear Mountains, passes into the Rocky Mountains. This range separates the Columbia from the Colorado basin, and is the ridge by which this "divide" joins the main divide of the continent.

Between the main chains of the Rocky Mountains and the Sierra Nevada, the Wahsatch range is the largest and most important. It extends from the 41st degree of latitude, north of Great Salt Lake, almost to the 34th. For the first half of this distance its general direction is nearly south; for the latter south-west; so that it passes from the 111th to the 115th meridian. Throughout its entire length it forms the divide between the waters of the Colorado and the Great Basin.

About the head-waters of Bear River, one of the three tributaries of Great Salt Lake, this divide appears to require some slight explanation. Although Great Salt Lake is 4200 feet above the sea, and the Wahsatch Mountains rise in magnificent proportions to the east and north-east of it, yet this most western part of the range does not represent the rim of the basin—the dividing ridge between the waters of Salt Lake and of the Rio Colorado,—for the country behind is still higher, and the mountains themselves in this locality are some 70 miles across. The consequence is that the rim of the basin is found to lie some 60 miles east of the western slopes of the mountains. The drainage of this mountain-belt of 60 miles in width collects in a central trough as Bear River. The river flows northwards in the trough amongst the mountains for about 300 miles, then bends westward around the western barriers, and flows southward into Great Salt Lake.

The central railway route (Union Pacific Railway) crosses the Wahsatch Mountains, passes around the northern end of the Great Lake, and then follows the valley of the Humboldt for 300 miles towards California. In approaching Salt Lake it is evident that the railway has to cross two main dividing ridges, 1st, the true rim of the basin, and 2ndly, the false rim, or the ridge lying between Bear River and the Lake. This ridge really consists of the lofty western range of the Wahsatch, and would have proved almost an insurmountable barrier, had not another tributary of the lake cut its way through it, forming Echo and Weber cañons.

The Colorado basin is separated from that of the Rio Grande and the Mississippi, on the east, by the continental divide or water parting of the Rocky Mountains, and from the watershed of the Laguna de Guzman, by an almost imperceptible divide, which crosses the level plateau of the Sierra Madre from the south-eastern extremity of the Burro Mountains to the mountains of Mexico. Thence the divide runs in a westerly course, sometimes in Mexican and sometimes in American territory, along the boundary line, separating the Gila branches of the Colorado from the streams of northern Sonora. We see, then, that the Colorado basin forms a large triangle, limited on the east by the dividing ridge of the continental watershed of the Rocky Mountains; on the south by the highlands about the Mexican boundary line; and on the north-west by the Wahsatch Mountains.

In the northern angle, almost reaching the 44th parallel, rise the waters of Green River. From the western slopes of the "summit plateau" of the Rocky Mountains further to the southward collect the heads of Grand River. These unite about 70 miles below the crossings of the old Spanish trail from Los Angelos to Abiquiu, about latitude 37° 30′, longitude 111°, and form the Rio Colorado of the West. The first tributary below the junction is the Rio San Juan coming from the east; then, about latitude 36° 15′, longitude 113° (Ives' Report), the next great tributary pours its waters into the Rio Colorado; this is the Flax River, or Colorado Chiquito (Little Colorado), and, lastly, the Rio Gila, which drains all the southern half of Arizona, enters the main stream at Fort Yuma, 60 miles above its mouth.

The entire Colorado basin consists of a series of table lands, rising one from the other and covering the whole country. In elevation they vary from 4000 to 7000 feet, and reach in some places a height of 8000 feet above the sea. They succeed each other in a series of steps, which generally present abrupt and wall-like edges, the more recent stratum occupying the highest portion of the plateau. Complete barrenness is the rule, fertility the rare exception; scarcely any vegetation, save the artemisia scrub, is to be found between the 36th and 42nd parallels; the earth for the most part is naked, showing the wear and tear of ages, the erosion of the primeval ocean, and the cracks and fissures of the more recent water-courses. Whence, we may ask, did the material come from, of which these table-lands are composed? In answer to this question I will quote Dr. Newberry, the geologist of Lieutenant Ives' expedition. "The question of the origin of the sediments composing the stratified rocks of the table-lands of the Colorado can scarcely be intelligently discussed, till we know more than we now do of the geology of a large area lying north of the Colorado, and of the broad and compound belt of mountains, which is covered by a single name —Rocky Mountains—but which, when carefully studied, will probably not be found to form a geological unity.

"This much, however, we can fairly infer, that the outlines of the North American continent were approximately marked out from the earliest Palæozoic times, not simply by areas of shallower waters in an almost boundless ocean but by groups of islands and broad continental surfaces of dry land. Since the erosion of rocks is always subaërial, or at least never takes place more than 40 feet below the ocean surface, it follows, that to form the stratified rocks of only that portion of the great central plateau which borders the Colorado, an island 300 miles in diameter and at least 6000 feet high—or, what is more probable, a continent of six times that area and 1000 feet high—was worn down by the action of waves and rains, and in the form of sediments, sand, gravel, clay, or lime, deposited on the sea-bottom."

These many thousand feet of sedimentary strata were converted into dry land by the gradual upheaval of the Plutonic rocks upon which they were deposited. Generally they were raised with but little disturbance of their original positions; still districts or rather lines of more powerful upheavals can be traced across the country, by the increased height of the table-lands, while here and there, more recent volcanic forces have thrust huge masses of igneous rock up through the sedimentary crust, forming mountains more or less isolated, and of great beauty, which contrast strangely with the eroded table-lands amongst which they rise. Such are the San Francisco mountains, Mount Taylor, and Bill Williams Mountain, all now extinct volcanoes.

The thousand springs of Green and Grand rivers which start from an elevation of from 10,000 to 12,000 feet, form cañons (that is to say, deep gorges) in the mountain districts only when some unusual obstacle bars their course. In the mountains which give them birth frequent rains have washed out sloping valleys, and the primitive rocks have generally succeeded in resisting to a great extent their erosive action. Further from their sources, beyond the influence of the mountain rains, these two rivers and their tributaries, in their passage over the table-lands of the great central plateau, have, by causes which we shall explain immediately, cut their way through them in channels, which deepen continually as they advance; and also, as they progress, present fewer and fewer open valleys to break the narrow and sunless perpendicularity of their gigantic walls; until, in the case of the Colorado, this penetrative tendency culminates in that mysterious gorge the Great Cañon of the Colorado, which until last year had never been traversed by any human being.

The Plateau of the Colorado, which is the name given to the district through which this river runs for 5 degrees of latitude, has been raised to an average elevation of 7000 feet. It extends in a north-westerly direction from a point south-east of the San Francisco Mountains, across the Colorado into Utah, and includes a portion of the country traversed by Grand and Green rivers, before they unite to form the Rio Colorado, as well as over a more considerable part of that crossed by the Colorado Chiquito along the latter part of its course.

"Over this plateau," says Dr. Newberry, "the Rio Colorado formerly flowed for at least 500 miles of its course, but in the lapse of ages, its rapid current has cut its bed down through all the sedimentary strata, and several hundred feet into the granite base on which they rest. For 300 miles the cut edges of the table-lands rise abruptly, often perpendicularly, from the water's edge, forming walls of from 3000 feet to over a mile in height. This is the Great Cañon of the Colorado, the most magnificent gorge, as well as the grandest geological section of which we have any knowledge."

We may, I think, conclude almost with certainty, that at some remote period during the present epoch, the lofty table-lands through which these rivers have cleft their way, had a much lower level than they have at present. Probably the

"Great Basin Region," lying to the westward, had not emerged from the Pacific ocean when these streams were wearing through the first hundred feet of the gorges which now enclose them. The upheaval of the table-lands was gradual; and was very unevenly distributed over all that vast plain—for it was originally a plain—lying between the Rocky Mountains and the Sierra Nevada. Wherever it happened that a perennial stream flowed over a plateau in process of upheaval, it wore its way deeper and deeper into the uprising strata, and as the rainfall was scant, the sides of the fissure thus formed retained their perpendicularity almost intact.

Since the winter of 1857-8, when Lieut. Ives and his party succeeded in examining the Cañon of the Colorado at two points in its course, no attempt has been made to throw any further light upon the structure or geography of this wondrous gorge. It chanced, however, that whilst our parties were surveying the valley of the Colorado Chiquito, an unfortunate prospector, named James White, was actually passing through the entire length of the chasm upon a simple raft of cottonwood.

A detailed account of this hazardous trip will be found in the first number of the 'Illustrated Travels,' and in my work on the Far West, 'New Tracks in North America.'

Between the Colorado plateau—through which the Little Colorado also cuts its way to join the main stream, like Grand and Green rivers, in a lofty side cañon of its own—and the Moquis country (another very elevated table-land), an elongated basin extends from the Mogollon Mountains north-west into Utah. As variegated marls here come to the surface, much of this wide trough has received the name of "The Painted Desert." Through a great part of this depression the Colorado Chiquito flows with open banks through fertile bottom-land of considerable extent till it reaches the Colorado plateau. To the north-east the country again rises step by step, mesa upon mesa; and upon the edges of several of these latter may be found those interesting fortified towns, the pueblos of the Moquis Indians.

When Lieut. Ives' party visited these regions, they tried to explore the country to the north-east, but want of water and extreme barrenness compelled them to return.

At the Moquis villages, the strata forming the table-lands begin to rise towards the east, and near Fort Defiance, where the Mesa country reaches an elevation of 8000 feet, they plainly show the disturbing influence of the most westerly axis of elevation of the Rocky Mountain system. Further east to the Rio Grande, and beyond it, they are much dislocated, and finally lose their distinctive character in the intricacies of the mountain ranges.

In the interval between Fort Defiance and the Rio Grande rises a great volcanic mountain, Mount Taylor (San Mateo), which, like that of San Francisco, has burst through the sedimentary strata and poured over them floods of lava, which are as fresh as though ejected but yesterday.

How, we may now ask, are cañons formed, and what are the physical conditions necessary for their formation?

Cañons are usually formed by the action of water only, unaided by volcanic action, which is often erroneously said to be the primary cause of the so-called fissures and cracks through which the waters flow. The physical conditions are, 1st, a dry climate, in which even periodical rains do not fall to any considerable amount; 2nd, the passage of never-failing streams from their distant and exterior sources through this dry country; 3rd, it is requisite that the surface strata should be of such a nature as easily to yield to the action of the current; but when once a groove has been furrowed and the water-channel definitely fixed, it does not appear to matter of what the underlying rocks are composed, since the unceasing attrition of ages has in some instances succeeded in cutting through hundreds of feet of the hardest granite; 4th, it is requisite that the slope of the land should be sufficiently great to ensure a rapid current.

It is impossible for a country in which cañons abound to be anything but sterile and utterly worthless, for the deep cuttings everywhere drain it to the utmost, and the waters, buried deep in the bowels of the earth, lie far beyond the reach of animal or vegetable life on the surface.

Before leaving these regions, one other question is worthy of our consideration, viz., To what causes are due the mesa or table-lands, features of this country? In the solution of this problem Dr. Newberry says as follows:—

"Like the great cañons of the Colorado, the broad valleys bounded by high perpendicular walls belong to a vast system of erosion, and are wholly due to the action of water. Probably nowhere in the world has the action of this agent produced results so surprising, both as regards their magnitude and their peculiar character. It is not at all strange that a cause which has given to what was once an immense plain, underlayed by thousands of feet of sedimentary rocks conformable throughout, a topographical character more complicated than that of any mountain chain, which has made much of it absolutely impassable to man or any animal but the winged orders of creation, should be regarded as something out of the common course of nature. Hence the first and most plausible explanation of the striking surface features of this region is to refer them to that embodiment of resistless power—the sword which cuts so many geological knots—volcanic force.

"The great cañon of the Colorado would be considered a vast fissure or rent in the earth's crust, and the abrupt termination of the steppes of the table-lands as marking lines of displacement. This theory, though so plausible and so entirely adequate to explain all the striking phenomena, lacks a single requisite to acceptance, and that is *truth*. Aside from the slight local disturbance of the sedimentary rocks about the San Francisco Mountain, from the spurs of the Rocky Mountains, near Fort Defiance, to those of the Cerbal and Aztec mountains on the west, the strata of the table-lands are as entirely unbroken as when deposited. Having this question constantly in mind, and examining with all possible care the structure of the cañons which we entered, I everywhere found evidence of the exclusive action of waters in their formation. The opposite sides of the deepest chasm showed perfect correspondence of stratification conforming to the general dip, and nowhere was there displacement; the bottom rock, often dry and bare, was perhaps deeply eroded, but continuous from side to side, a portion of the yet undivided series lying below. The mesa walls should be included in the same category with those of the cañons: sometimes, indeed, they are but the sides of cañons miles in breadth."

Leaving the weird and worthless regions north of the 36th parallel, let us glance for a moment at those forming Central Arizona, and lying between the Colorado Chiquito and the Rio Gila. Nearly all the region has been greatly disturbed by innumerable ranges of mountains more or less volcanic, while the surface is covered with the products of volcanoes now extinct, and with the drift washed from the mountain sides.

Between the head-waters of the Rio Gila and the Colorado Chiquito is a very high tract of country which is chiefly occupied by the various ranges known as the Mogollon Mountains; and which shed their waters in a southern direction to form the Rio Gila, and in a north and north-western direction towards the Colorado Chiquito. But the hostile Indians of these regions have, up to the present time, so kept the white man at bay that no explorations have been made through them, and we know nothing of the country except from the few daring prospectors whom thirst for gold has led to risk their lives in its pursuit. The reports of these men, who are wonderfully shrewd and reliable, describe the land as being very beautiful and of great fertility. Forests of noble pine cover large portions of the mountains, enclosing well-watered "parks" and valleys of considerable extent, clothed with luxuriant Grama grass; and although much of it is wild and barren, cut up by ravines and impassable barriers, still the signs of mineral wealth everywhere abound, and predict a prosperous future for this country.

The moisture from the Gulf of Mexico has no great obstacle to bar its way between the Texan coast and these regions, and to cause its precipitation before arriving at them; for the "summit-plateau" in this latitude has sloped away, and the Rocky Mountain chains have ceased to be conspicuous, so that the rainfall about the mountains of Central Arizona is far greater than the travellers who have passed north, or, as is more usually the case, south of them in the more level though more arid districts, are aware of.

The next belt of mountains, or line of upheaval, also trending north-west and south-east, is that important Cordillera which has the Aztec Mountains, Bill Williams Mountain, and perhaps the San Francisco peaks, to mark its northern extremity. It passes obliquely across Arizona, cresting the San Francisco plateau; forming the Pina-leño Mountains, north and south of the Rio Gila; the Chiricahui Mountains, their continuation; the Sierra Calitro and Sierra de Santa Cantarena, which are parallel ranges; then, crossing the boundary line into Mexico, the mountain sources of the San Pedro and Santa Cruz rivers form part of the same belt of upheaval. At last it is merged into the Sierra Madre ranges, which cap the plateau of Mexico. If the Sierra Madre, or main mountain chain of Mexico Proper, be a continuation of any northerly chain, it is of that which I have just mentioned, and not, as is commonly but erroneously supposed, of the Rocky Mountains, which undoubtedly lose themselves at least two degrees to the north-east in the broad plateau of New Mexico, known as the Plateau of the Sierra Madre.

When a range of mountains forms the main continental water-parting, the Mexicans of the locality very commonly call it the "Sierra Madre," or mother mountain: thus it happens that there are several Sierra Madres, which belong not only to the actual Rocky Mountain system north of the 34th parallel, but also rise from the highest plateau of Mexico proper. And while referring to this distinction, I may add that I, for my part, should like to carry the same idea further, and leave out the word "Sierra" in the name given to the great plateau of Southern New Mexico, thus calling it simply the Madre, or Mother Plateau, because the continental divide actually crosses it, although no range of mountains, or in fact any perceptible inequality of surface, marks the water-parting.

North of the Rio Gila the description of the Mogollon mountain belt applies with equal truth to these ranges, except that portions of the country amongst the latter have been settled partly by Mexicans, the remnant of the Spanish occupation of the 16th and 17th centuries, and partly by Americans since the annexation in 1848. Extensive mining districts have been discovered, mines have been opened, and found to yield abundantly; herdsmen have commenced raising stock, and farmers have found that crops could be grown, even without irrigation, in many places around Prescott (the capital) situated in the northern part of this belt of mountains. But the wild Indians of these regions are waging, as they have been waging for ages, unceasing war against the cultivator of the soil, whether he be Aztec, Mexican, or Anglo-Saxon; and although vastly inferior beings in every respect, these savages are even now successfully stamping out the efforts of the white men to inhabit the country. The Apaches, who have ever lived by the plunder of their neighbours, are at this moment successfully driving back the tide of emigration in central and southern Arizona, and neither the settlers nor the military dispersed throughout the country are able to contend successfully against them.

Wherever we or our parties have been, we have found the whole country strewn with the ruins of villages, irrigating canals and pottery, belonging to a populous race now extinct. The Indians of the Moquis villages, which have been referred to, those of the Pimo villages, who cultivate large tracts of land in the Rio Gila bottoms, and the wandering tribe—the Papagos—who inhabit a large tract of country, almost a desert, south of that river, are the only civilized Indians now to be found in Arizona. The fertile valleys of these regions once supported a very considerable population. Have the Apaches overpowered them, or have recent physical changes in the country led to their disappearance? There is much to be said in favour of either hypothesis; but as this subject is not a geographical one, I shall not occupy the meeting in discussing it.

Between the comparatively fertile belt of mountainous country which we have been considering and the Rio Colorado, lies a district less elevated, and becoming very dry and arid as we pass westward. It is, however, covered more or less with short ranges of bare volcanic hills which are rich in minerals, gold and silver veins, and which are attracting the attention of miners from California more and more every year. At last the Colorado desert itself is reached. The river having traversed the lofty plateau in almost a due westerly course, takes a great bend to the south, and emerging from its cañoned table-lands into the lower country, meanders through broad and sultry valleys below Fort Yuma, which become more and more parched and sterile as they near the head of the Gulf of California.

The Rio Gila does much the same thing; it cuts through the Pina-liño Mountains, north of Camp Grant, by means of a succession of cañons. Its *bottom*-lands are extensive and fertile *above* these cañons for a distance, which at present is not ascertained, and *below* them for about 50 miles in the Pimo country. But further west it enters the sterile country known as the Gila desert, the continuation northward of the great Sonora desert, and passes through it for the remaining 150 miles of its course, until it reaches the Colorado. This completes our rapid survey of the Colorado basin. We will presently cross the Wahsatch mountains forming part of its western boundary, and take a bird's-eye view of the Great Basin beyond.

Passage of the Aravaypa Cañon.—Whilst surveying and exploring for a route through the Pina-leño Cordillera, a little south of the Rio Gila, I passed through a cañon of great interest, formed by a tributary of the Rio San Pedro—the Aravaypa—which little stream cuts through the centre one of the three ranges forming that extensive cordillera. As this cañon is a good type of its class, I think that a detailed description of it may not be an uninteresting ending to this sketch of the Colorado Basin.

We had, of course, to dispense with waggons, and, whilst we were cutting our way through 30 miles of gorge to Camp Grant from the head of the cañon, they had to be sent round by a southern route, 180 miles, to the same military post.

Descending from Railroad Pass, a gap between the Pena-leño and Chiricahui mountains, we entered a trough between these two almost continuous ranges, and the Sierra Calitro parallel to them. We followed this trough in a N.W. direction for 22 miles before we entered the basin of the Aravaypa, and rose during that distance 280 feet. Soon a deep groove appeared at the bottom of the trough, which, as we travelled down it, became deeper and deeper, until its sides assumed the appearance of cliffs. A few miles further, a dry watercourse appeared; then a spring, causing great fertility, while back beyond the cliffs rose the serrated summits of the volcanic ranges on either side. These ranges gradually approach each other, until the trough itself becomes obliterated, and the walls of the groove in its centre were of necessity merged into the mountain sides. At the point where the mountains seem to unite, the Cañon proper begins. This point is 25½ miles from the first appearance of a central groove in the trough, and during this distance we descended 1104 ft.

We remained a few days, at the entrance, to arrange the packs for the mules we intended to take with us, and to obtain, if possible, a few more soldiers from a military post 50 miles distant; for the Aravaypa Cañon was the home of the Apache, and a place where it was considered almost madness to venture under any circumstances. Six days and five nights were spent in cutting our way through this wonderful defile, and, though the remembrance of it cannot but be a vivid one, I feel that it is quite impossible to give anything like a fair description of it.

Guarding the narrow entrance rises a conical hill, to which we gave the name of "Look-out Mountain," for it commands a very extensive view both into the Cañon and up the Cañada in the opposite direction; furthermore, it is most probable that when this country was inhabited it was used for that purpose, for the stone foundations of a building which formerly covered the summit are still distinctly visible. Close under this hill a very large stream gushes out of the ground, the waters of which more than double in size the Aravaypa stream. Without this large permanent supply of running water, the Aravaypa Cañon could (probably) never have been formed. In the first two miles the walls are perpendicular on one side and sloping on the other; the former do not exceed 500 feet in height, but at the end of that distance a large triangular mass juts up from the centre of the ravine, which seemed to us to bar all further progress. The stream, however, had managed to turn around it, and, by following in its bed, we succeeded in doing so too. From this point the walls on both sides are perpendicular. They are formed for the first few miles of conglomerate alone, which is horizontally stratified; it is, in fact, drift washed down by primeval floods from the mountain side. But as the gradual fall of the stream bed, which is on an average 50 feet per mile, brought us deeper into the earth, we reached the sandstones, and gradually passed through them to the hard granite beneath.

Luxuriant vegetation fills up the space between the walls; the undergrowth consists of willows, young trees, bunch grass, reeds, &c., forming in many places an impenetrable thicket, and above these a succession of noble trees tower up towards the sky, as if striving to rival the rocks on either side, and to gain a glimpse of the upper world. Under a grove of the loftiest cotton-woods and sycamores, at a distance of four miles from the head of the cañon, we threw down our blankets for the first night's rest. Not far distant a few deserted Indian wigwams were visible, perched upon the top of the cliff, which painfully reminded us of danger, and the setting sun beautifully illuminated three Norman watch-towers, which some freak of nature had carved out upon the precipice which rose above our grove of trees.

The obstacles which our surveyors had to contend against naturally made our progress very slow,—not more than from two and a half to three miles per day; for a clear path had to be cut through the brushwood which choked up the narrow passage, and every tree which obstructed the vision of the levellers had to be felled. Some Mexicans, who had lost their way and joined us a few days previously, were of great assistance to us; we hired six of their animals for pack-mules, and several of the men to help us as axemen, in cutting a path through the thickets. I obtained a mule for my photographic "outfit," and was thus enabled to take a number of views of the gorge. During the second day's advance we came to a cave hollowed out in the northern wall, capable of concealing about fifty men, and opposite this we picked up several Indian skulls and human bones. To these relics there hangs a tale:—

In 1863 a company of Californian volunteers, on their way eastward to fight the "rebs," and glad enough to get a little professional practice *en route*, joined in an expedition headed by a Captain Tidball, the object of which was to break up the chief rancheré of the Aravaypa Apaches, which was situated on this spot. The citizens and soldiers, guided by some tamed Apaches, who were kept at Camp Grant, entered, as we did, the head of the cañon, and came upon the Indian village just as the evening was changing to night. They hid quietly until daybreak, and then attacked the savages with such effect that out of seventy who formed the band but twelve escaped; all the rest were massacred, the women and children by the tamed Apaches, the warriors by the Americans. The fate of this band was not undeserved, for they had been the terror of the country round for a long time previously, and had committed many frightful atrocities upon the helpless Mexican and American settlers. These Apaches had carried on agriculture to some extent in the cañon, for we passed the remains of a few small irrigating canals in places where the space between the walls left a sufficient extent of bottom-land for such a purpose.

As we advanced, the cañon became more and more tortuous; bold walls of rock often enclosed us, in front and rear, as well as on either side; nor could we tell which way to turn until we had come close upon the apparently insurmountable barrier. Higher and higher towered the walls. For the first few miles they were flat and continuous from base to summit, although portions here and there stood out like huge needles or lofty spires from the main cliffs; but after attaining a certain height the walls became divided into two, the upper portion of which seemed to lean a little back, and to rise from the lower one, like a cliff springing from a cliff. The walls in fact became two stories high, and each story measured about 400 feet. The strata of the upper story or cliff continued as before to consist of conglomerate, but gray sandstone appeared at the base of the lower one, and gradually extended upwards. Caves and grottos became very numerous, and every mile added to the grandeur of the chasm.

The stream had to be crossed over and over again, often at every hundred yards, and it was curious to see how active the little axemen of nature—the beavers—had been, for many a wetting was saved, by our men on foot being able to cross over on the large trees, which, having been felled by these little fellows, had fallen athwart the stream. Nor were beavers the only inhabitants; deer came down to drink of the brook; but by what paths remained a mystery to us. Quails and doves were very abundant in places; birds with beautiful plumage, some bright red, others rich blue, and a third variety, a black and white kingfisher, with a bright-red crest, especially attracted our notice. I was photographing with a friend one afternoon in the cañon, about half a mile in the rear of the surveyors, when suddenly a succession of shots ahead made us start up from our work. The gloomy grandeur of such a place was not good for the nerves, and we feared terribly an Indian attack where the advantages of position were so much against us. Leaving the camera, black tent, and the rest, to take care of themselves, we hastened towards the front. A horse, minus his rider, dashed rapidly past, which did not increase our confidence; on arriving, however, at the scene of action we were not a little relieved on finding that a fine flock of turkeys had so tempted the foremost of our party, that, forgetful of the alarm they would cause, they seized their rifles and fired at them. The explosion caused by even a single shot in such a chasm sounded like the report of a dozen cannon, so great was the reverberation, and so many the echoes which followed it.

About 7½ miles from the entrance, the cañon becomes so narrow that it appears only as a cleft between the huge perpendicular walls which tower above us; there is no space whatever on either side between the bed of the stream and the rocks, so that the only passage is in the river itself. The action of the water, moreover, has hollowed out the base of the southern wall-rock for 20 or 30 feet of its thickness, so that you ride under the rock itself for some distance.

The first "narrows," as we called these passages, having been passed, we came to an open space of some 15 acres, giving us a good camping-ground and plenty of grass for the stock. This space is situated about the centre of the cañon, and is very beautiful, being filled with splendid timber, cotton-wood, sycamore, live oak, ash, willow, walnut, and grotesque old mesquits of most unusual size. Fine branches of mistletoe hung from many of the trees, and seemed to me like the familiar faces of dear friends suddenly encountered after a long separation. Just past this open space a great change takes place. In order, it would almost seem, that the traveller might not weary of the cold grey sandstone and conglomerate formations, the sombre tints and horizontal strata, large quantities of volcanic rock, with their smooth facets and rich tints, varying from purple and red to black, burst into view, and alter completely the appearance of the walls. A deep rich fringe of basaltic columns caps the terraces on either side, and this lava-form coating is bright and shining, the edges are as sharp in outline as if cut with a knife, and produce fantastic forms in the shape of turrets, &c., quite different in appearance from those met with previously.

Nor is the change to be seen only in the rocks; the vegetation immediately shows the difference of soil; and, identical in position with the new strata, there appeared for the first time on our route, the *Cereus giganteus*, the largest Cactus with which botanists are acquainted. Here these huge grooved columns thrust their thick trunks from between the crags and rise up on all sides far above our heads, to heights varying from the baby plant to forty feet. They seem to require no earth, and in places the walls are covered with them to the very summit, The secondary columns shoot out from the central stem and then turn upwards with studied regularity, forming a circle of four or six arms around the parent trunk. Besides the "monumental cactus," as it is sometimes called, large bushes of prickly pear, tufts of Spanish bayonet and Magay, with other kinds of spiny plants, also find a genial abode up amongst the crags, producing a contrast most singular and striking between the grotesque thorny vegetation upon the walls and the graceful foliage in the narrow passage beneath.

A little further, the rocks on either side approach so closely as to obliterate for a second time the entire passage, and the bed of the stream alone remains between the walls for two and a half miles of its course. At this part the walls present another break in their perpendicular height, and appear to consist of three terraces or cliffs piled one above the other, each capped, as before, with basaltic columns; thus showing, as it appears to me, the real nature of this terraced form. Each cliff or terrace is in fact a land-slip into the gorge, the lowest terrace representing the part earliest detached; for, as each terrace is covered with lava-form basalt, it is evident that at some time each ledge so covered must have formed part of the surface of the ground over which the lava had flowed.

Between the two narrows the cañon did not widen much; so that the lengthening shadows overtook us very early in the evening, and obliged the surveyors to cease from their work, And when the sun had left the upper world, and night had really come, the blackness of darkness around us was absolutely awful, and the stars which covered the long streak of sky above, seemed to change the heavens into a zigzag belt, every inch of which was radiant with diamonds.

Our camps too were very picturesque. The mesquit-tree, with its tortuous stems, grows to an unusual sizehere, and, as the wood makes magnificent fuel, we found the foot of one of them to be the best place to pass the night. Dotted about amongst the trees the cheerful blaze of a dozen fires would light up the branches and foliage, making the darkness visible, and giving us a glimpse now and then of the massive walls which towered up above us on all sides. We discovered an amusement for our long evenings, quite in harmony with the place.

Amongst the party of Mexicans, there was a tame Navajo Indian, who had been captured by his present master some years ago. This savage had many accomplishments, and amongst others, he knew the war songs and dances of several of the neighbouring tribes. He was very fond of our camp, for he seldom went away empty-handed; and when the fires were blazing up, and a good circle had been formed for him, he would come and sing his war songs until far into the night. A different dance accompanied each chant; the music was very wild and plaintive—a dreary dirge in a minor key; at particular parts it became very slow and piano, then a quick movement usually followed, the dance corresponding to the music, until the climax was reached by a series of yells which made the whole cañon re-echo with unearthly sounds. Our oft-repeated applause had the effect of exciting the little fellow to such an extent that he usually kept it up till he was thoroughly exhausted. So melancholy were the intonations of all these curious chants, that they seemed to be the fitting funeral marches of a people speedily and for ever passing away from their place among the races of the earth.

Three-fourths of the cañon was traversed and surveyed in four days. The remaining fourth, however, presented the most formidable obstructions; for large masses of wall-rock had fallen into the narrow cleft in so many places, that no sooner had we succeeded in getting our mules and horses over one pile of débris, than a fresh one lay across our path. We gradually entered, however, a more broken and open country, and gaps in the walls became proportionally frequent. Confusion seemed here to reign supreme; no longer did the abrupt walls hem us in, but large masses of rock—I may say sides of mountains—lay piled up all around. We measured one perpendicular cliff, which from its position was accessible to our instruments, and found it 825 feet high, and this was far below the average of the side-walls.

From out of this chaos the cañon gradually emerged, widening out, and approximating more to a narrow valley. The south side first begins to break away into sloping bluffs, covered with cactus and stunted vegetation, while the north side continues perpendicular for three miles and a half beyond the second "narrows," where it joins a huge mountain of igneous formation, consisting of six basaltic terraces, one above the other, and forming a fine landmark for miles around, to show the position of the cañon. Beyond this we have foot hills on both sides for two miles more, when the cañon becomes lost in a widening valley, which, some six miles further on, joins that of the Rio San Pedro, just south of Camp Grant. In this valley nearly all the water of the Aravaypa sinks into the earth. I hear, in fact, from residents at the fort that for many weeks during the year no surface water whatever enters the Rio San Pedro from it, although in the cañon there is always a fine stream.

An Indian trail, which is easily followed in single file, except where the bed of the stream alone is left, or where the whole pass is blocked up with débris, leads quite through the gorge. In the first half of the cañon there are at least five lateral means of exit through arroyos which enter it, one on the southern and four on the northern side, but there is no escape whatever for the rest of the way. Indian trails lead up these side-ravines. Some of our men in advance came one day across an Indian encampment in which the ashes of a fire were still smoking, but nowhere did we see an Indian. Their wigwams were of very frequent occurrence, during the last 8 or 10 miles, especially in the valley between the cañon and Camp Grant. They all consisted of a round frame-work of sticks, tied together with grass at the top, and lined within and without with willow, grass, and weeds, a little space being left for the door. It was evident, then, that we had frightened the Apaches out of their natural haunts. They feared, perhaps, another massacre, or they looked upon our instruments, which seemed to take up so much of our attention, as some infernal machines, intended to destroy them, had they given us a chance.

Be this as it may, we were glad enough to come aboveground again, for, apart from the oppressive feeling caused by such a place under any circumstances, the actual fact was always present in our minds that our enemy from above could, almost at any moment, have completely annihilated our whole party. Had the Indians thought proper to hurl rocks down upon us as we passed through many parts of the passage, from which there was no possible escape or hiding-place, not one of us could have escaped to tell the tale of this adventure.

On Wednesday, the 26th of November, 1867, I arrived at Camp Grant, and two days afterwards the whole party reached it safely. This post, consists, like all the others, of a collection of adobe houses, and log huts, with large covered verandahs to keep off the sun, for it is very hot here in summer. The view from it over the country is a very peculiar one, for, although not a tree is to be seen on the neighbouring hills, the *Cereus giganteus* takes their place. I have never seen it growing thickly, so as to hide a patch of ground from view; but everywhere these solitary pillars with their encircling arms are to be recognized, and as no other kind of vegetation is in the least conspicuous, they become the most prominent objects in the landscape.

The result of the survey from Railroad Pass to Camp Grant is the following:—

	Miles.	Feet above tide-water.
Summit of Railroad Pass	..	4411
Playa de los Pimas (centre of trough)	6·50	4275
Head of Aravaypa Cañada	22·52	4474
Eureka Spring	5·89	4164
Head of Aravaypa Cañon	19·41	3370
Leave high walled cañon	14·49	2645
Camp Grant	12·12	2174
Total in miles	81·93	

The Rio San Pedro enters the Rio Gila, 11·55 miles from Camp Grant, at an elevation of 1911 feet above the sea.

At the end of this paper will be found a table of distances and elevations determined by our surveyors whilst crossing the continent by the 32nd parallel, from Kansas City on the Missouri to the Pacific at San Francisco.

GENERAL FEATURES OF THE GREAT BASIN.

Between the Wahsatch Mountains and the Sierra Nevada, extending northward beyond the 42nd parallel, and southward into Lower California, lies a district, considerably larger than France, which goes by the name of the Great Basin. It has received the name simply from the fact that none of its rivers enter the sea. It is not an appropriate name, however, for it embodies a glaring topographical error.

The Colorado basin represents in shape a triangle, whose apex lies to the N. or N.E.; the Great Basin (we must retain the usual name), is also shaped like a triangle, whose apex points to the S. or S.W. From this apex at the Gulf of California, the ground rises from the level of tide-water, to about 5000 feet in Central Nevada, and this is about the general level of the whole country between the Sierra Nevada and the Wahsatch Mountains, in the broad part of the Great Basin. North of the Humboldt, where the drainage divides, this elevation is exceeded, and there are innumerable local depressions which scarcely reach 4000 feet, but north of the 37th parallel there are few places below this elevation.

There is great uniformity throughout the whole of the country; the surface is covered everywhere with short ranges of volcanic mountains of recent origin. Their general trend seems to be influenced mostly by their relative positions with respect to the great ranges on either side of them—the Sierra Nevada and the Wahsatch Mountains—for the tendency is to run parallel to whichever of these they are nearer, and in the centre of the basin the general direction is N. and S. In crossing the Great Basin from Donner Pass in the Sierra Nevada, to the Wahsatch range at Salt Lake, we passed over no fewer than twenty of these ranges, the basin at that latitude being 700 miles across. On the 35th parallel, nine ranges were crossed, on the 32nd a less number; as in the one case the distance was less than 300 miles, and in the other under 200 miles. The ranges consist chiefly of volcanic tufa, trachytic breccia, trachyte, and diversity of coloured porphyry, all more or less decomposed. They are mountains in miniature, beautiful in outline, variegated by many-tinted rocks, and usually perfectly bare of trees or even shrubs. They show on their sides the effect of rains and water to an enormous extent, for the volcanic rocks of which they consist are easily decomposed by the elements and then washed away. The ranges may, in former times, have been very long and continuous, but it is evident that, ever since their formation, water has been cutting them through, washing them down, and filling up the valleys with drift from their sides. The average width of the ranges would be about 12 miles, the height above the general level of the basin from 1000 to 4000 feet.

The valleys are mostly about 20 miles wide, and often of great length, but more frequently they are limited above and below by transverse ridges, which, however, are sometimes washed down to very inconsiderable dimensions, so as to form a number of separate little basins. The well-preserved water-marks which are everywhere visible, indicate extreme dryness, upon which dryness most of the peculiar characteristics of the country depend. Artemisia scrub (sedge-brush), and grease-wood,* alone spring from the dry, parched earth, except where some stream of unusual persistence supports a row of cotton-wood † trees, and a few acres of grass along its edges. From the decomposition of volcanic rocks, the soil in its ingredients is very fertile, and, where irrigation can be supplied, yields most abundant crops. There are broad level districts, however, called by the settlers "Alkali Flats," which are covered with salts, usually nitrate of soda, and are thereby rendered perfectly barren. These white glistening sheets in the dry unsteady atmosphere of the desert, form the most tantalising mirages to which a thirsty traveller could be exposed. At certain seasons they are covered for a short time with a thin coating of water—the local drainage of the surrounding district—which is soon dissipated by the scorching sun.

The plateau of the Basin region was undoubtedly the last part of the western continent raised from the sea—the last from which the Gulf of California retired. Even now subterranean fires are active, and the process of gradual upheaval may still be going on. Earthquakes are frequent, mud-volcanoes are still to be found in places, huge cracks in the earth's surface have occurred within the memory of living men, craters recently active dot the whole district, and hot-springs are so numerous that I have counted fifty-two jets of steam issuing from the ground, like pillars of smoke, in one valley alone.

When the "Great Basin" came into existence, or rather emerged from the waters, there were dry lands and mountains east, west, and north of it, shutting out from it the moisture of the Pacific Ocean, as well as any that might travel thither from the far-off Gulf of Mexico. The climate may be considered to have been then not unlike that of the present time, so that the rainfall was far less, even in the new-born "Basin region," than it was over the Colorado Basin in its primeval state, which was then washed by broad seas. The effect of these climatic peculiarities was that a sufficient quantity of rain never fell upon this Basin region, to form a complete system of drainage from the highest lands down to the sea.

We can easily conceive that in the formation of an extensive drainage system, the little primitive streams form lakes at the first serious obstacle met with in their course. These lakes, when full to overflowing, find at length some outlet, and wear the channel of exit deeper and deeper, until the obstacle is overcome, and the lake drained. Thus lake after lake is formed, and disappears as each succeeding obstruction is cut through, until the independent streams, having sought the lowest levels of the country, unite their waters into a single channel, and so pass into the sea. There is nothing whatever in the physical formation of the Great Basin to have prevented the formation of one great river, emptying into the Gulf of California, either as an independent stream or as as a tributary of the Rio Colorado. It is not because the "Great Basin" is really a complete basin without an outlet, or with a rim presenting an insurmountable barrier to the drainage, that its waters do not escape to the sea, but rather because it is not a single basin at all, but a collection of perhaps hundreds of basins, which have always remained in their primitive isolated condition, each with its stream and its lake at the end of it, and because the separate streams have never had force enough to break through the barriers which all streams have at first to encounter, and to unite their waters, so as to form a complete drainage-system. There is no doubt that formerly the atmosphere was more humid, and that more rain fell, for the remains of fresh-water shells of recent species, covering large tracts of desert, prove the existence of lakes much greater in extent than any which can now be found, but instead of being filled to overflowing, and breaking through their barriers to the sea, these lakes lost more water by evaporation and percolation than their tributary streams supplied, and thus were gradually dried up.

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* *Obione canescens.*

† *Populus angustifolia.*

The drainage, then, of the "Great Basin" is in a primitive stage, and will probably always remain so. Wherever there are lofty mountains, there we are pretty certain to find a lake proportionately great. If the lake has no outlet, it of necessity contains salt water, which becomes salter and salter as time advances, from the concentration, by means of evaporation, of the salts washed into it from the decomposed rocks of the mountains. But when the lake has an outlet, the water is, as usual, fresh. Great Salt Lake is an example of the former class; Utah Lake, in the same region, of the latter. Most of the lakes, however, are not permanent; they form broad sheets of water after rain, but are perfectly dry and barren during the greater part of the year. They vary greatly in elevation and size. Great Salt Lake exceeds 4000 feet above the sea-level;

Sevier, 5000; Lake Tahae, 6250; Monro Lake, 6454; Pyramid, 3940; Williamson's, 2388; Morongo Sink, 1500; Mojave Sink, 1000; and Perry Basin, 530.

Two depressions, at least, are below the level of the sea; the one is a large saline flat, situated a little north of the Mexican boundary line, which is usually called Soda Lake. It is about 70 feet below tide-water, and although nearly always perfectly dry, a long dyke, known as Hardy's Colorado or New River, flows through the desert towards it when the Great Colorado is flooded. Leaving the latter stream about half-way between Fort Yuma and its mouth, it receives the back-water of the Colorado, flows northward across the boundary line, and becomes lost in the desert before reaching Soda Lake. If it had sufficient volume this large depression would become filled with fresh water—a very desirable result.

The most wonderful depression, however, is Death Valley—the sink of the Amargoza—which is 175 feet below the sea. Although this depression is an arid desert, an enormous area of country drains into it, extending from lat. 37° to the San Bernardino Mountains, from which the Mojave River rises, and comprising not less than 30,000 square miles. At first sight it might appear that the existence of these depressions rather contradicted what I have said as to the causes which have produced the hydrographic peculiarities of this "Basin Region." But a glance at the Colorado Basin at once, I think, decides the question. Let us suppose that a humid climate had poured abundant rains upon the tableland, 1000 feet high, which separates Death Valley from the lowlands at the head of the gulf. A fine sheet of water would cover Death Valley, and this lake would have had an outlet to the sea through the opposing tableland. If 7000 feet of tableland yielded to the waters of the Rio Colorado, surely 1000 feet of similar formation would not prevent the overflow of a large lake from reaching the coast.

Great Salt Lake, the largest in the "Basin Region," is about sixty miles long, by ten broad,—a very small sheet of water, compared with the fresh-water lakes of the Eastern States, or those of Central Africa. But there is abundant evidence all around it to prove that in former times it covered an area twice, if not thrice, as great as it occupies at present. Of late years this lake has steadily been rising; so steadily, that if this rise continues, thousands of acres which are now lake-shore will soon be covered again with water. It is a question of considerable interest, whether the large tracts of land now irrigated by the Mormons have not caused this result, by considerably extending the area of evaporating surface, and increasing, as a consequence, the yearly rainfall.

The largest stream in the "Great Basin" is the Humboldt, which is more than 500 miles long, and passes from east to west across the entire district at its northern part before emptying into Humboldt Lake. The valley of this river is said to be generally so sandy as to be worthless, even if irrigated; but this conclusion may be premature, for many of the lands most productive when irrigated, look sandy and utterly worthless in their parched and wild condition. Much of the Rio Grande valley bears testimony to the truth of this assertion. Reese River fertilizes a narrow valley of about 100 miles in length, near the centre of the Basin, in which are several agricultural settlements. The same may be said of the Truckee, Carson River, Walker River, and some others, which flow from the eastern slopes of the Sierra Nevada into lakes in the desert. Along these, and the western slopes of the Wahsatch Mountains, a great many spots are favoured with enough running water to support a considerable population; and, in fact, all over the "Great Basin" the most tempting localities are being colonized and settled by little communities of Mormons from Salt Lake city, who are all agriculturists and nothing else. If, however, the Great Basin had only these attractions to hold out to emigrants it would be a region of as little interest as any on the globe; but amongst these barren monotonous ranges lie the vast deposits of silver ore, which, since the discovery of the Comstock lode, have been found to be scattered throughout the entire region. The lode just named has yielded, in the four years ending April 1st, 1866, 51,380,500 dollars, or upwards of 11,000,000*l.* sterling. Its present annual yield is about 600,000 lbs. avoirdupois of silver (containing more or less gold), worth about 4,000,000*l.* sterling,—a yield which exceeds the present yearly total of all the silver mines in Mexico. One Mining Company alone—the Sarage—last year (1867) paid in dividends a larger sum than that derived from all the metallic mines of England and Wales put together. Any day we may hear of another "Veta Madre" (as the Mexicans call one of these wide rich veins) being discovered; for by far the greater part of the Basin is as yet quite unknown, even to the indefatigable prospectors who brave all privations in the search for the precious metals. Mr. Ross Brown, in his last report on mining operations in the districts west of the Mississippi, gives the total yield of the gold-fields of California for the year that is passed at the small sum of 25,000,000 dollars, while that of Nevada is 20,000,000 dollars, of which the Comstock lode furnished about 14,500,000 dollars, thus leaving the large amount of over 5,000,000 dollars as the yield of the newly-discovered districts scattered throughout the Great Basin.

I may say, in conclusion, that there are many parts of the Colorado Basin still inviting exploration. There are, at least, three degrees of territory lying between the Mogollon Mountains on the west, and the Rio Grande del Norte on the East, quite unknown. Small bands of Apaches, however, prowl over this fertile upland country, and with these savages it is always war to the death.

West of this district lies another, drained by the Aqua Fria, Rios Verde, San Francisco, Salinas, and other northern branches of the Gila, flowing through fertile valleys shut in by lofty perpendicular sides—cañons often miles in width—and once thickly inhabited.

There is another vast region between the 39th and 36th parallels of latitude west of the Rocky Mountains, in which water is scarce, but hostile Indians are few—this is essentially a country of table-lands, the former is volcanic. The one contains, probably, no mineral wealth, the other is rich in the precious metals and minerals.

Then there is the 500 miles of cañon—the Great Cañon of the Colorado. If James White passed through it on a raft, surely at high water two parties might explore it thoroughly by entering one by Green River, the other by Grand River, in India-rubber boats built for the purpose.

Lastly, there is much of Sonora and Chihuahua unexplored. Through the former state I travelled for 700 miles. Both are well worthy of a visit, and, as the tropical rains reach them, the upland regions are fertile. The climate is unsurpassed throughout all these inland plateaux.

Table of Distances and Elevations across the American Continent, from the Missouri River to the Pacific Ocean, about the 32nd parallel of latitude.

Elevations above Tide-water.		From Kansas City (1318 miles from New York.)	Local Distances.	From Kansas City, *viâ*			
				Raton Mountain Route.	Puntia Pass Route.	Aubrey Route.	Cimarron Route.
Feet.			Miles.	Miles.	Miles.	Miles.	Miles.
Of low water of Bridge seat.	549 591	State Line, near Kansas City, to Lawrence	36	36	36	36	36
	925	Fort Riley	99	135	135	135	135
	1446	Fort Harker	83	218	218	218	218
	1860	Fort Hays	71	289	289	289	
Grade	2957	Sheridan (end of track, 1868) ..	116	405	405		
	3056	Fort Wallace	12	417	417		
	3126	Pond Creek	3	420	420		
Surface of water	*4056	Cheyenne Wells	40	460	460		
	*4582	Denver Junction	10	470	470		
	5180	Denver	160	630			
	4192	Big Sandy	5	475	475		
		Colton's Spring	15	490	490		
Surface of water in Arkansas ..	3725	Fort Lyon	35	525	525		
	4266	Mouth of Chequaco	50	575			
	6166	Cimarron Pass (point of Raton Mountain)	40	615			
	5634	Red River	64	679			
		Fort Union (near)	54	733		*698	*661
	6233	Los Vegas	22	755		720	683
	5406	Pecos River, near Anton Chico ..	26	781		746	709
	6917	Cañon Blanco Pass (Summit of Spanish Range)	30	811		776	739
Surface of water	5042	Rio Grande, San Felipe	57	868	903	833	796
		Albuquerque ..	60	871	933	836	799
Surface of water	4803	Isletta	60	871	945	836	799
	4803	Isletta (below Albuquerque) ..		871	945	836	799
	4349	Fort Craig	102	973	1047	938	901
	3896	Mouth of Santa Barbara Cañon ..	73	1046	1120	1011	974
	4853	Summit West of Rio Grande ..	17	1063	1137	1028	991
	4585	East foot of Cook's Mountain ..	14	1077	1151	1042	1005
	4876	Summit of Cook's Mountain ..	3	1080	1154	1045	1008
	4538	West foot of Cook's Mountain ..	4	1084	1158	1049	1012
	4716	North end of Sierra Redondo ..	6	1090	1164	1058	1018
	4472	Arroyo Miembres	9	1099	1173	1064	1027
	4849	Ojo de la Vaca	12	1111	1185	1076	1039
	4944	Summit at end of Burro Mountain	8	1119	1193	1084	1047
	3992	Barney Station	22	1141	1215	1106	1069
	3955	East foot of Peloncillo Mountain	21	1162	1236	1127	1090
	4148	Summit Runk's Pass	4	1166	1240	1131	1094
	3438	West foot of Peloncillo Mountain	12	1178	1252	1143	1106

* Barometer elevations.

TABLE OF DISTANCES AND ELEVATIONS—*Continued.*

Elevations above Tide-water.	FROM KANSAS CITY (1318 miles from New York.)	Local Distances.	From Kansas City, via			
			Raton Mountain Route.	Puntia Pass Route.	Aubrey Route.	Cimarron Route.
Feet.		Miles.	Miles.	Miles.	Miles.	Miles.
3816	East foot of Railroad Pass (Chiricahui Mountains)	27	1205	1279	1170	1133
4192	Summit of Chiricahui Mountains	7	1212	1286	1177	1140
3998	West foot of Chiricahui Mountains	6	1218	1292	1183	1146
3985	East foot of Calitro Mountains ..	6	1224	1298	1189	1152
4522	Summit of Calitro Mountains ..	10	1234	1308	1199	1162
3256	Mouth of Nugent's Pass (Tres Alamos)	21	1255	1329	1220	1183
1985	Fort Grant	63	1318	1392	1283	1246
1692	Mouth of San Pedro	11½	1330	1403	1294	1257
1594	Head of Cañon of Gila..	9	1339	1412	1303	1266
1202	White's Ranche	44	1383	1456	1347	1310
1066	Saccaton	15½	1398	1472	1363	1326
	Pima Villages	11	1409	1483	1374	1337
	Maricopa Wells	12	1421	1495	1386	1349
*108	Fort Yuma (75 feet above the river)	167	1588	1662	1553	1516
*1101	East foot of San Gorgonia Pass ..	154	1742	1816	1707	1670
*2808	Summit of San Gorgonia Pass ..	22	1764	1838	1729	1692
1118	West foot of San Gorgonia Pass ..	24	1788	1862	1753	1716
*1118	San Bernardino	2	1780	1864	1755	1718
*1048	San Fernando Mission	75	1865	1939	1830	1793
*3164	Summit of Soledad Pass	43	1908	1982	1873	1836
2889	Desert	8	1916	1990	1881	1844
	Willow Springs	34	1950	2024	1915	1878
*3080	East foot of Tehachapa Pass ..	17	1967	2041	1932	1895
4008	Summit of Tehachapa Pass	15	1982	2056	1947	1910
795	West foot of Tehachapa Pass ..	35	2017	2091	1982	1945
	Gilroy	210	2227	2301	2192	2155
Tide-water	San Francisco	80	2307	2381	2272	2235
	This distance from Kansas City to San Francisco may be reduced, by estimated saving, between Fort Craig and Saccaton, of 75 miles, to		2232	2306	2197	2160
	New York to San Francisco (measured)		3625	3699	3590	3553
	Ditto (shortest)		3550	3624	3515	3478

* Barometer elevations.

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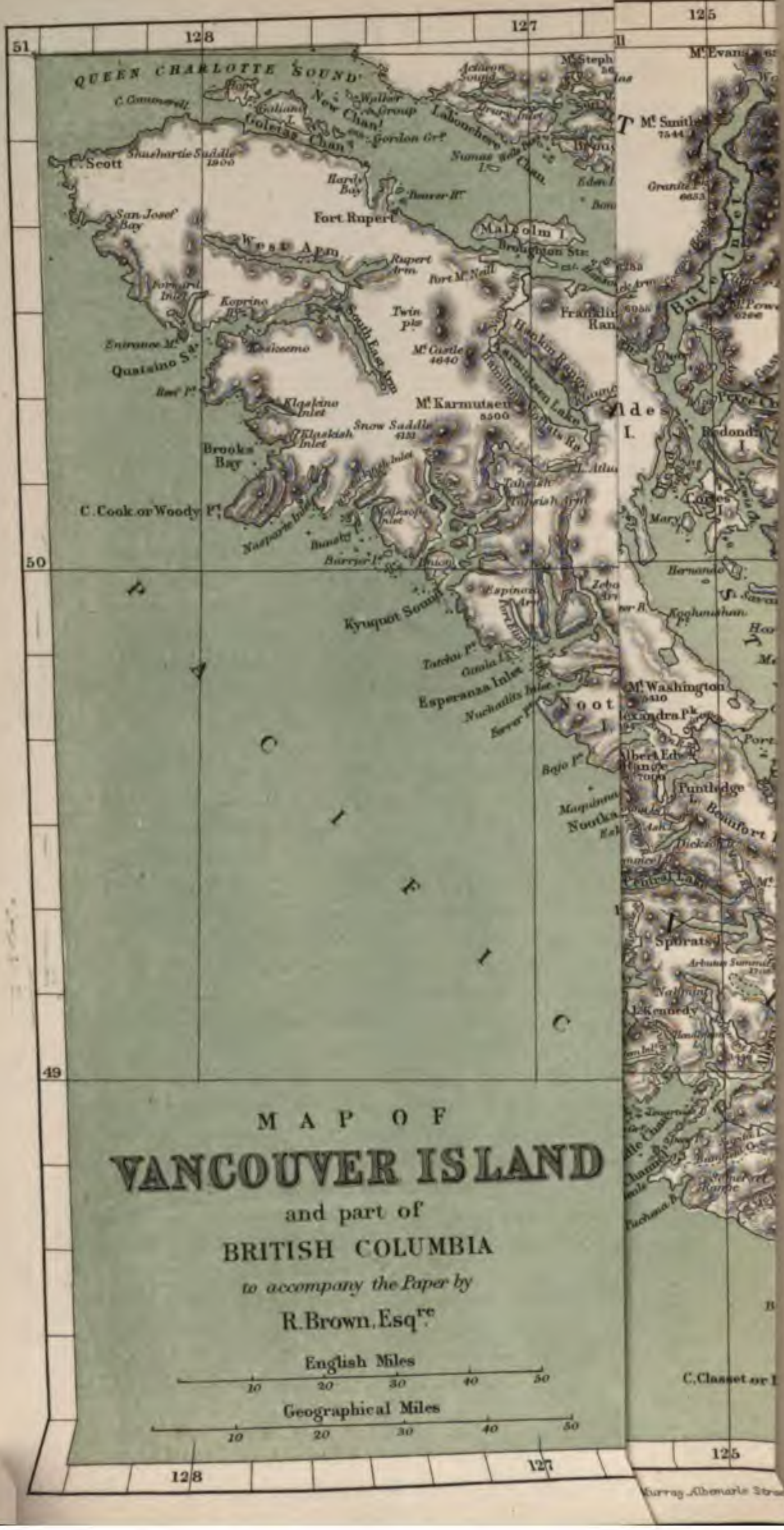

MAP OF
VANCOUVER ISLAND
and part of
BRITISH COLUMBIA
to accompany the Paper by
R. Brown, Esq^re^

VII.—*On the Formation of Fjords, Cañons, Benches, Prairies, and Intermittent Rivers.* By Robert Brown, F.R.G.S, &c.

Read, March 8, 1869.

I have classed the several physical features enumerated in the title of this communication together, not only because they are all found in the same geographical region, but because many of the causes producing them are mutual, and necessary to a right understanding of all four.

1. Fjords.—Intersecting the sea-coasts of various portions of the world, more particularly in northern latitudes, are deep, narrow inlets of the sea, surrounded generally by high precipitous cliffs, and varying in length from 2 or 3 miles to 100 or more, variously known as "inlets," "canals," "fjords," and even, on the western shores of Scotland, as "lochs." The nature of these inlets is everywhere identical, even though existing in widely-distant parts of the world, so much so as to suggest a common origin. On the extreme north-west coast of America they intersect the sea-line of British Columbia to a depth, in some cases, of upwards of a hundred miles, the soundings in them showing a great depth of water, high precipitous walls on either side, and generally with a valley towards the head. On the eastern shore of the opposite Island of Vancouver no such inlets are found, but on the western coast of the same island they are again found in perfection; shewing that, in all probability, Vancouver Island was isolated from the mainland by some throe of Nature prior to the formation of the present "canals" on the British Columbia shore, but that the present inlets on the western shore of Vancouver Island formed, at a former period, the sea-board termination of the mainland, and were dug out under conditions identical with those which subsequently formed the fjords now intersecting the coast.

Jervis Inlet may be taken as the type of nearly all of these inlets here, as well as in other portions of the world. It extends in a northerly direction for more than 40 miles, while its width rarely exceeds 1½ mile, and in some places is even less. It is hemmed in on all sides by mountains of the most rugged and stupendous character, rising from its almost perpendicular shores to a height of from 5000 to 6000 feet. The hardy pine, where no other tree can find soil to sustain life, holds but a feeble and uncertain tenure here; and it is not uncommon to see whole mountain sides denuded by the blasts of winter or the still more certain destruction of the avalanche which accompanies the thaw of summer. Strikingly grand and magnificent, there is a solemnity in the silence and utter desolation which prevails here during the months of winter, not a native, not a living thing to disturb the solitude; and though in the summer a few miserable Indians may occasionally be met with, and the reverberating echoes of a hundred cataracts disturb the silence, yet the desolation remains, and seems inseparable from a scene Nature never intended as the abode of man. The depths below almost rival the heights of the mountain summit: bottom is rarely reached under 200 fathoms, even close to the shore.* The deep inlets on the Norwegian coast, known as *fjords*—a familiar name, now applied generally to such breaks in the coast-line—are too well known to require description. On the coast of Greenland are again found similar Sounds, indenting both sides of that island (?), but more particularly the western, or Davis Strait shore. Most of these inlets are thickly studded with floating icebergs, and others are so densely choked with them as to receive the name of ice-fjords. All of these fjords form the highways by which the icebergs float out from the glaciers at their heads, whenever these prolongations of the great *mer de glace* of Greenland (the "inland iis") reach the sea. After a long and careful study of these fjords in most parts of the world where they are found, I have come to the conclusion that we must look upon glaciers as the material which hollowed them in such an uniform manner. Everywhere you see marks on the sides of the British Columbian fjord of ice action; and there seems no reason to doubt but that they were at one time the beds of ancient glaciers, which, grinding their outward course to the sea, scooped out these inlets of this great and uniform depth. At the time when these inlets formed the beds of glaciers, the coast was higher than now. We know that the coast of Greenland is now falling;† and, supposing that the present rate of depression goes on, many glacier valleys will in course of time become ice-fjords. After having seen not a little of the abrading action of ice during three different visits to the Arctic regions, extending in circuit from the Spitzbergen Sea to the upper reaches of Baffin's Bay and westward and southward to the "Meta Incognita" of Frobisher, I cannot side with those geologists who, judging ice action merely from what is seen of the comparatively puny glaciers of the Alps and other European ranges, are inclined to under-estimate the abrading power of the glacier. I do not, however, for a moment pretend to assert that the valleys in which glaciers in the Arctic regions (or elsewhere) now lie were originally formed by the glacier.

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* 'Vancouver Island Pilot,' p. 139 (Richards).

† In a paper 'On the Elevation and Depression of the Greenland Coast,' read to the British Association at Exeter (1869), I have given what I consider to be the true explanation of the seemingly contradictory statements on this subject among writers on the Arctic regions.

On the contrary, I am at one with those who believe that these rents were chiefly due to the volcanic disturbances which threw up the mountain ranges, and that the glacier merely took advantage of the depression. However, by long abrasion it hollowed out the valley into the form we now see it in the fjords under description. At this present day, not far from the head of most of these inlets, glaciers are found in the Coast Range and Cascade mountains in British Columbia; and along both ranges marks of old glacier action can be seen 2000 to 3000 feet below their summits, and even near the sea-margin. Such a depression of the coast, with the presence of the lower temperature then prevailing, would fill these fjords with glaciers. I may add, that though Professor Whitney,* on the most hearsay evidence, seems inclined to think that the Northern Drift is not found over Vancouver Island and British Columbia, it certainly exists in a well-developed condition.

2. CAÑONS. — This convenient word, of Hispano-American origin, is used extensively all over the Pacific to express the high perpendicular clefts through which many of the rivers of the West flow often for miles. These cañons are generally found where the river breaks through some mountain-range, or other obstruction of a like nature, on its way to the ocean. Such are the cañons of the Stiken in Alaska; the cañon of the Fraser in British Columbia; the gorges of the Columbia, Wisconsin and Canadian, or the Cañon of the Colorado in New Mexico. An examination of these cañons shews them to have been caused by the force of the rivers which flow through them, when these rivers contained (as there is every evidence to prove they did at one time) a greater body of water than at present. During the time when these glaciers covered the sides of the Cascade and other ranges adjoining these rivers, a greatly-increased amount of precipitation would swell the volume of these streams, enabling them to score deeply the surface of the plateau, and "force mountain barriers to reach the ocean, cutting deep channels in its shores where we now find them." These rivers seem at one time to have been merely the outlets of great lakes, which emptied themselves into the ocean by one or more small rivulets, creeping through the opposing barrier of mountains by rocky gorges or volcanic clefts. Gradually they seem to have enlarged these clefts until a greater body flowed through them. Some of the lesser emptiers were cut off, and joined their volume to the main stream, giving it importance and strength, until, in the course of ages, they graved their record in the huge

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* 'Proc. California Acad. Sciences,' vol. iii. p. 272.

rocky cañons through which they now flow,—the great descendants of the humble outlets by which they once found their way to the country on the other side of the Cascade Mountains and to the Pacific. It appears that many of the rivers of the West have, at one time or another, changed their course and bed. Some of these changes seem to have occurred in very remote times, prior to the present arrangement of the superficial formations. At all events, the gold miner every now and again comes upon these old river-beds in the course of running his drifting-tunnels or sinking his mining-shafts. They look eagerly for them, as they are generally rich in gold. Other changes seem to have occurred in very recent times, and seem to have been mainly owing either to the causes I have attempted to pourtray, or to some volcanic action, resulting in its throwing the river out of its former course into a new channel. Such is the *Grande Coulle* of the Columbia River, well known to all voyageurs. I have spoken of the great cañon of the Colorado River, of which the first published account is contained in the work of Castenada, giving a description of the expedition of Don Francisco Vasquez de Coronado in search of the "Seven Cities of Cibola," in 1540-1, during which time they discovered this river, and named it the *Rio del Tison*. The walls of this cañon are probably 5000 feet in height, and when we consider that the river traverses a magnificent defile of this description for upwards of 200 miles, the effect of the scenery may be imagined. Many years ago, it is said, a party of trappers built a large boat, and made the attempt to descend the river through the defile of the cañon, and were never heard from afterwards. They probably dashed their boat in pieces, and were lost by being precipitated over sunken rocks or high falls. In 1857, Lieutenant Ives, of the United States army, attempted the exploration of this great gorge with a light-draught steamer, but without success; and in 1865 another attempt was made, but resulted in equally unfruitful results.* Its descent is said to have been recently accomplished by an adventurous traveller, who, in the desperation consequent on his pursuit by Indians, made his escape through that dangerous outlet. An almost equally stupendous cañon is that of the Red River of the South. This cañon shows that these remarkable defiles were not formed by any paroxysmal convulsion of nature, for when a tributary stream enters the main river it passes through a tributary cañon. The action of rivers in forming such gorges as these in geological and modern times is an important but much-neglected subject in geology.*

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* In August, 1865, I sent a detailed account of this attempt to Sir Roderick I. Murchison; but it met the fate of many such documents, and never reached him.

3. BENCHES.—On the banks of many rivers of the western slope of the Rocky Mountains are found curious terrace "benches," not unlike in general appearance to the famous "parallel Roads of Glen Roy," but (without stirring up such debateable ground) altogether different in character. These benches are always found to the *east* of the Cascade Mountains, and are well seen at Lilloet, on Fraser River, in British Columbia. Lord Milton and Dr. Cheadle figure them in their 'North-West Passage by Land,' as seen at this point. These benches are generally flat and of a good soil, though, as everywhere else to the east of the Cascades, very dry. From what I have already said in reference to the formation of Cañons, I need scarcely enter into any long explanation of their origin, as it is at once self-evident, if the explanation I have given of the formation of the clefts just named is correct. In a word—these benches were formed when the Fraser (or other river) was a lake, only emptied by some little streams (or a stream), now and then gathering strength, and as barrier after barrier was broken down, these benches mark the successive stages of the lowering of the lake's margin, until it finally sunk into the channel of the river. I have supposed these breaks to have occurred at intervals, as some portion of the wall of the gorge gave way. This level may have continued for years, it may be centuries, when another break happened, and so on; the height of the "bench" marking the character of the gap made each time. These breaks may have been (indeed no doubt were) assisted by the volcanic disturbances, which at a comparatively late period, seem to have riven all the country in that region, and volcanoes in the mountains through which these rivers flow were doubtless the active agents of these disruptions.

The same "benches" can be seen more or less distinctly wherever the physical contour of the country is the same, or where a river is barred from reaching the sea, under similar conditions to what the Fraser bears to the Cascade range. That these benches were not connected with glacier action is shown (among other proofs) by the rich character of the soil, and the total absence of *morainès*, or other marks of glacier action.

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* The late Professor Edward Hitchcock, of Amherst, U. S. America, has published a memoir "On the Erosions of the Earth's Surface, especially by Rivers," in 'The Smithsonian Contributions to Knowledge,' vol. ix.; but this treatise I am unable, in the place where this paper is written, to refer to,—a matter which I the more regret as I am convinced, from a familiar acquaintance with many of the venerable author's other researches, that it must contain many strikingly original observations.

These broadly marked "benches" ought not to be confounded with some terraces found on various rivers, such as the Columbia, &c., to the west of the Cascades. These terraces are probably connected with glacier action when the mouth of that river was hollowed for more than a hundred miles of a great and uniform depth. The channel of the Golden Gate (San Francisco) has a maximum depth of nearly 50 fathoms, being greatest immediately in the line of the axis of the chain, through which it is cut, while the bar without, and the bay within, are silted up to within less than 10 fathoms of the surface. The straits of Carquines, near the mouth of the Sacramento, have a maximum depth of 18 fathoms, and in the line of the range which bounds them an average depth of 14. Dr. Newberry[*] thinks that these phenomena are due to glacier action of a similar character to that which hollowed out the fjords; and on the whole there seems some reason to accept his theory, with reservations. In passing down the Columbia from the Dalles (Lat. 45° 35′ 55″ N., Long. 120° 55′ W.) to the Cascades, a curious feature is seen, which though scarcely strictly coming under any of the headings of this paper, is yet interesting, as helping to explain some of the phenomena of bench and cañon. Under the water can be seen, standing upright and firmly rooted in the soil, the remains of a forest of *Abies Douglasii* (Lindl.). General Fremont noticed this in his voyage down the river, and attributed it to a landslip. This explanation may be easily proved to be erroneous, and must, I think, though generally received without investigation, give way to a totally different one. The vicinity of the Cascade exhibits marks of recent volcanic action and disturbance of the traps. The Indians even say that, at one time, the river used to flow under an archway, but that during an eruption of Mount Adams this bridge was thrown down, forming an island in the centre, and helping to give rise to the "Cascades." The effect of this would be to form a dam in the water, raising its waters above the scene of disturbance, and submerging the forest which grew down to its margin. The very recent date of this submergence is shown by the sound character of the wood. The "bench" is also well figured in the plate of the Cañon of Psuc-see-qùe Creek (Oregon) in volume vi. p. 85 of the 'Pacific Railroad Surveys.'[†]

4. PRAIRIES.—The central portion of the American continent, as indeed of Asia and Africa (witness the great "Steppes" and the "Sahara") is almost treeless, and with a correspondingly

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[*] 'Pacific Railroad Surveys,' vol. vi. p. 43.

[†] On this subject, see also Hector, in the 'Quarterly Journal of the Geological Society,' 1863, p. 399.

small rainfall. The Cascades and the Rocky Mountains prevent the moisture-laden breezes of the Pacific from reaching the tracts under their special influence, and the distance of great prairies from the sea-board of the Atlantic, renders the moist wind of little influence before reaching the country over which the great "plains" extend. East of the Mississippi the rainfall is greater, and here we have an almost unbroken forest. Between the Cascades and the Rocky Mountains, for the same reason, trees are scarce and the climate dry; so much so, that some portions of the country are little better than desert, while immediately to the west of the former range, the slopes of the mountains are covered with luxuriant forest and fertile soil.

Along the line where the treeless and forest districts meet, local causes determine the presence or absence of trees. Belts of timber border the streams, and cover the more porous and absorbent soils, while level surfaces, with fine and unporous soils, sometimes very wet, and sometimes very dry, sustain only a growth of grass, which could endure the alternations fatal to trees. Annual fires have had their influence in extending the area of grassy surface, and over much of their middle ground, by man's intervention, the causes limiting the growth of trees could be removed, and the forest area extended. The forces of nature are here so nicely balanced, that slight causes would make one or the other preponderate. The many theories which attribute prairies to other causes than the want of water are wholly erroneous, and of only local value. On the great prairies west of the Mississippi, every variety of soil and surface fails to sustain trees, and only a change of climatic conditions will there change the grass-covered surface to forest.*

It would, however, be generalising on very imperfect data were we to conclude that all grassy land known vaguely under the term "prairie," was formed under the same conditions; for to the west of the Cascades are also prairies of some extent, due to totally different causes. These West of the Cascade "Prairies" may be shortly enumerated under three heads:—

(1.) "Tide lands" overflowed by the tide only at its highest periods, and of excellent soil. These are almost invariably found at the mouth of rivers, and the absence of trees upon them is due to the overflow by salt water, or the coldness of the mountain flood, which must sap the roots of deeply growing plants like trees.

(2.) Other small prairies are found along the sources of rivers, particularly mountains always marshy from springs, and producing a growth of plants almost identical with those at 5000 feet on the mountains of North-West America or on the northern regions of Europe and America. The "Cranberry swamps" are of this nature.

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* J. S. Newberry, "On the Origin of Prairies," 'Transactions of the American Scientific Association,' 1866 (Buffalo Meeting), and Foster's 'Mississippi Valley.'

(3.) Dry prairies—with rich black vegetable loam—said to be sometimes too rich for wheat. On Whidby's Island and other places on De Fucas Straits, such as Orcas and San Juan Islands, are prairies of this description, which though now high above water, appear to have been formed of a deposit from some river when the distribution of land and water was different from what it is now. The Nisqually plains, the Great Willamette Prairie, &c., are examples. They are generally thinly scattered with oak (*Quercus Garryanus*), and with a very characteristic group of plants, rarely or never found out of such tracts. Often scattered with lakes and clumps of trees, their park-like character has been frequently noticed and admired.* A modification of this, or perhaps rather of the tide lands, is seen in strips of sand, grass lands covered with coarse grass found at various places along the coast, and distinguished by such plants as *Abronia arenaria, A. umbellata, Orobus littoralis, Franseria, Calystegia*, &c. These dry prairies are scattered through the forest land, such as the Squak Prairie, near Seattle, in Washington Territory, and even the Willamette Prairie in Oregon must be classed as of this nature. The Comox Prairie in Vancouver Island, the Cowichan Prairies in the same island, &c., are also of a similar character. What strikes one particularly is the abruptness with which the forest ends, giving these prairies almost the appearance of "clearings" in the forest. They can certainly be produced by no climatic or terrestrial peculiarities, as the neighbouring forest is subject to influences in every respect the same. I quite agree with Dr. Cooper, to whose excellent work on the 'Natural History of Washington Territory' I have been much indebted, that these prairies bear the mark of having been at one time much greater, and that they have been to a great extent produced by burning, either through the Indians, or by the forests catching fire. I know that in various places the forest is now covering tracts which within the memory of man were grassy prairies on which the Indians grazed their horses; and on the Nisqually prairies, only as far back as 1847, several seamen and officers of one of H.B.M.'s vessels, then lying in Puget Sound, were buried on the prairie. Their graves are now in a dense thicket of trees. Other prairies, such as most of the Willamette Prairies, appear never to have been covered by forest, and great changes seem to have occurred since these were formed. Several species of animals if not confined to the prairies are yet quite characteristic of them, such as the gopher (*Thomomys Douglasii*, Rich.), meadow mice (*Jaculus Hudsonius*, Zimm.), sewellel (*Aplodontia leporina*, Rich.), and the prairie mole (*Hesperomys austerus*, Baird). These animals are principally seen on the Nisqually prairie, and seem, like certain plants found there, to have wandered from the east of the mountains.[*]

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* Wilkes, 'Exploring Expedition;' Lord, 'Naturalist in British Columbia,' and in 'Temple Bar,' Oct., 1866; Suckley and Cooper, 'Nat. Hist. Washington Territory,' &c.

On some of these prairies are peculiar mounds of gravel and soil, which appear to have been produced by some tidal influence when these prairies were covered by the sea. The whole subject of the formation of Western prairies is very interesting, but would lead me into discussion foreign to my subject, so that I can only touch on what would require a volume specially to treat of.[†]

In connection with this subject, I may mention that in Southern Oregon and other parts, the south side of a hill is generally bare, while the north is covered with vegetation, a fact taken advantage of by the Indian skirmisher.

5. INTERMITTENT RIVERS.—All the great rivers of North-West America rise either in the Rocky Mountains or in some of its tributary spurs, and though the Cascade Range gives various tributaries to the rivers which flow into the Pacific, none of them, with the exception of the Willamette, Rogue River, Chehalis, and some smaller streams, have their source in the Cascade Range: indeed the former unites with the larger Columbia, and under that name reaches the ocean. Only one river of the slightest consequence rises on the eastern or arid side of the mountains, viz., the Deschutes, which, after keeping along near the base of the mountains, dashing over falls and between high rocky walls, joins the Columbia just above the "Dalles" of the latter river. Some indeed (like the Klamath) take their rise in lakes, fed by streams from the mountains, and gathering strength find their way to the Pacific through some of the broken portions of the chain immediately south of the 42nd parallel of north latitude. It is only the great rivers such as the Columbia, which gather-

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[*] Cooper, *loc. cit.*

[†] I have described these Western Prairies, and other points in the physical geography of North-West America, more fully in a memoir entitled "Das Innere der Vancouver Insel" (Peterman's 'Geographische Mittheilungen,' Heftes i.–iii. 1869), in a paper "On the Geographical Distribution of the Coniferæ and Gnetaceæ" ('Trans. Botanical Society, Edinburgh,' vol. x. p. 175); in another, "On the Geographical Distribution and Physical Characteristics of the Coal Fields of North-West America" ('Trans. Edin. Geological Society,' 1868–9), in an official report of my 'Explorations in Vancouver Island' in 1864 (Victoria, V. I., 1865), and in a separate work now publishing, entitled 'Horæ Sylvanæ.'

ing tributaries on every hand, such as the Snake (the Saptin or Lewis River of the older travellers), the Kootane, the Flathead, &c., can muster strength to cross the "great desert" or "basin," and reach the ocean in triumph. The smaller ones are less fortunate and are swallowed up in this Sahara of the west, gradually lessening and lessening until they are lost in the sand. Such are the "sinks" of Carsons and Humboldt rivers to the south. Sometimes these rivers rise and sink several times in the course of a few miles, and their course can only be laid down by alternate dotted and "full" lines. At least we suppose them to be the same river, for in this strange cavernous region another curious phenomenon presents itself, viz., that of small rivers springing cold and clear, like Minerva full armed from the brain of Jove, right from Mother earth, without undergoing any of the preliminary operations which their slow-going sisters suffer in older lands, but again, after describing a sullen course, making fertile some oasis in the desert, disappearing at once under the ground. An even still more curious feature presents itself in some of the creeks flowing from the snows of the Cascades; down their eastern slope sometimes in the forenoon we would encamp by the side of a stream with but barely sufficient water for camp purposes, but on returning in the evening found it roaring and crashing along so full of water as to render the fording of it a matter of difficulty, and again in the morning would find it almost dry, with the marks of last night's flood visible on the wet sand and gravel. I see that General Marcy narrates a similar circumstance when exploring the Red River of the South,* but failed to account for it, though I believe that the explanation I am about to give will be found not very far from the truth. These streams head in high mountains, and the sun is not of sufficient power to melt the snow which forms their volume until late in the day, when they gather force, and again decrease after sunset until they are almost dry. I have seen muleteers near the base of Mount Shasta (14,400 feet) in North California waiting for the rising of the creek, like the children of Israel for the smiting of the rock; and it was sometimes long after dark before the stream would be heard rushing down its former dry bed. So familiar was this phenomenon that sufficient water for breakfast would be saved over night, knowing that the creek would be almost dry before morning.

In this paper, for the sake of conciseness, I have endeavoured to present the conclusions at which I have arrived rather than the data on which these deductions were founded. I trust, however, that I have to some extent presented sufficient facts to

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* 'Army Life on the Border' (1866), p. 135.

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Map of
SPITZBERGEN
to illustrate the Paper
by Professor Nordenskiöld & Captⁿ Von Otter.
Track of the Expedition
Glaciers
Track in 81° 42' N. Lat. the farthest point reached

establish the points at which I have been aiming, viz:—1. FJORDS are in almost every case identical in formation, and were the beds of former glaciers. 2. CAÑONS are formed by the action of river currents. 3. BENCHES are the marks of the successive levels of the river when in the form of a lake, and the successive levels are the results of the sudden breaking down of barriers tending eventually to form the present cañons. 4. PRAIRIES in the interior of America are due to the cause which renders arid the greater portion of the interior of continents, viz., want of rains. 5. INTERMITTENT RIVERS are the result of the dryness of the great basin owing to the moist breezes of the Pacific being intercepted by the peaks of the Cascade Mountains, the melting of the snows, and other minor causes, and the "sinks" of rivers are due to these same causes (especially the drought), and the volcanic cavernous character of the country.

VIII.—*Account of the Swedish North-Polar Expedition of* 1868, *under the Command of* A. E. NORDENSKIÖLD and FR. W. VON OTTER. By A. E. NORDENSKIÖLD and FR. W. VON OTTER.

Read, March 22, 1869.

THE study of the natural history of the polar regions has been of late years prosecuted in Sweden with so much interest that, exclusive of the present year's undertaking, no less than three [*]

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[*] These were the following:—

The Expedition of 1858, fitted out at the expense of Otto Torell. The following gentlemen took part in the undertaking: O. Torell, A. E. Nordenskiöld, A. Qvennerstedt. The Expedition visited the western coast of Spitzbergen, and brought home considerable zoological and geological collections.

The Expedition of 1861, fitted out at the public expense. The gentlemen who took part in the expedition, besides the proposer and chief, O. Torell, were A. von Goës, A. T. Malmgren, F. A. Smitt, G. von Yhlen, zoologists and botanists; B. Lilliehöök and W. Kuglenstjerna, commanders of the vessels; C. W. Blomstrand, C. Chydenius, N. Dunér and A. E. Nordenskiöld for geological and physical investigations. The expedition visited, in both vessels, the western and northern coasts of Spitzbergen, made extensive journeys in boats for the purpose of constructing a topographical and geological map of the group of islands, and of examining the northern part of the triangulation for degree-measuring, which the present President of the Royal Society, General E. Sabine, as early as 1826, proposed to get executed, in these high northern regions, and lastly brought home with them a collection of materials for studying the *fauna*, *flora*, and geology of the islands, probably not surpassed in completeness by any similar collections from districts situated at so great a distance from the centres of civilisation.

The Expedition of 1864, fitted out at the public expense, chiefly for the purpose of continuing the survey for the measurement of the degree. The gentlemen who took part in the undertaking were A. E. Nordenskiöld, chief, N. Duner and separate expeditions have been sent out from this country to the arctic seas. When Nordenskiöld last winter again brought forward a proposal for a new expedition, on a different plan, which was to set out in the autumn from the northern coast of Spitzbergen and penetrate farther northward, the means requisite to defray the expenses of the expedition were in a few days raised in the second city of Sweden, Göteborg [Gottenburg], at the instance of the resident governor, Count Ehrensvärd. When, moreover, the Government, in order to assist the undertaking, fitted out and manned the steam-ship *Sofia*, well adapted for the purpose, strongly built of Swedish iron, and originally intended to carry the mails over the Baltic in winter, the new expedition was enabled to assume a more extensive character and embrace a wider compass than had originally been intended.

Most expeditions of this kind have had for their object to attain as high a degree of north latitude as possible; but a glance at their history will convince us how difficult and uncertain the attainment of this object is, and how frequently an insignificant circumstance has obliged the, in other respects, best planned expeditions to return without any scientific result whatever,—a contingency which there would have been no reason to apprehend if proper care had been taken in the scientific furnishing and manning of the expedition. In order to remove all fear of the new Swedish expedition having a result of this kind, it was determined that in this, as in the preceding Swedish arctic expeditions, a continuation, as general as possible, should be made of the researches in natural history commenced by their predecessors. For this purpose the expedition was, by the Royal Academy of Science in Stockholm, provided with a carefully-selected and appropriate scientific apparatus,* and was accompanied by as numerous a body of professional scientific men as room and circumstances permitted.

The plan of the journey was, during the summer and early part of the autumn, to pay a visit in the *Sofia* to Beeren Island and Spitzbergen, and carefully examine both the marine and terrestrial fauna of both lands; their flora, both phanerogamous and cryptogamous, as also their geography and geology. It was also intended to make deep soundings, and to take meteorological and magnetical observations, &c. A supply of coal was to have been deposited by a ship, hired for that especial purpose, at some fitting spot on the north-west corner of Spitzbergen,

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A. J. Malmgren. The expedition visited the southern part of Spitzbergen and Storfjord, completed the survey for the degree-measuring, and brought home rich geological, zoological and botanical collections.

* The London Royal Society and the University of Helsingfors contributed to the instrumental apparatus of the expedition.

which is accessible till late in the season; which tract the *Sofia* was accordingly to visit during the course of the autumn, and whence some of the scientific men were, in the beginning or middle of September, to return in one of the colliers to Norway. The rest were to endeavour, in the *Sofia*, to make their way farther north, and, if necessary, to pass the winter (circumstances permitting) in some appropriate harbour of the Seven Isles, which form the Old World's most northern archipelago.

The gentlemen who took part in the expedition were:—*Geologist*,—A. E. Nordenskiöld;* *Captain*,—Fr. W. v. Otter, R. SW. N.; *Lieutenant*,—A. L. Palander, R. SW. N.; *Physician*,—C. Nyström; *Natural Philosopher*,—S. Lemström; *Zoologists*,—A. E. Holmgren, A. J. Malmgren; F. A. Smitt; *Botanists*,—Sv. Berggren, Th. M. Fries; *Geologist*,—G. Nauckhoff.

The vessel was manned by fourteen seamen, together with zoological conservator Svensson, and six dredgers, hired in Norway. The ship placed at the disposal of the expedition having been, under the inspection of Captain von Otter, duly fitted out in Carlscrona, and furnished with provisions for somewhat more than a year—or, when account is duly made of the game that in these parts one may always reckon upon, for about a year and a half—and touched at Göteberg to take on board the scientific apparatus and the men of science who took part in the undertaking, anchor was weighed on the 7th of July. The 16th–20th Tromsö was visited for the purpose of taking in coal, &c.

On the 22nd the *Sofia* cast anchor in the southern harbour of Beeren Island, where some members of the expedition landed to study the natural phenomena of a place difficult of access on account of the want of a good harbour; while the remainder continued on board the vessel, which cruised in the neighbourhood, and occupied themselves with soundings and with an examination of the local marine fauna.

Beeren Island is, as is generally known, a small island situated between Spitzbergen and Norway, which, after the melting of the winter snow, forms a most desolate plateau of from 50 to 100 feet high, which, on the southern and eastern sides, rises so as to form two considerable mountains, Mount Misery (1000 to 1200 feet) and Fogelberg (Bird Hill), and terminates towards the sea in a perpendicular precipice, the rendezvous for the wonderfully numerous flocks of birds which choose that island for their place of rest and incubation. The plateau is covered partly by small shallow lakes, partly by thoroughly hard, even, and barren sand or pebble plains, partly by low mile-long heaps of sharp-edged stones, which one at first sight would suppose to be vast moraines, evidences of the ice-period, during which the valley between Mount Misery and Fogelberg has been formed. But on closer examination we find here evidences of every possible transition, from an even, hard, uncracked sandstone-flag to a sandstone-flag with small cracks; and again to a shattered stone flag with larger cracks of a foot, an ell, or a fathom broad; thence to a collection of colossal rocky blocks, still fitting accurately one to another at the cracks; and lastly, to a disordered moraine-like heap of stones, formed exclusively of sharp angular blocks. Glaciers do not exist here, nor are real moraines or ice-marks to be met with.

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* The geographical and hydrographical researches were to be performed by Nordenskiöld, von Otter, and Palander. These last—of whom, in consequence of their office, one was almost always on board—also took upon themselves the meteorological observations. Nyström assisted the zoologists, and also directed his attention to the remarkably interesting hygienistic features of these regions.

Neither these heaps of stones, so distressing to the pedestrian, which have undoubtedly been produced by the effect of frost and water on the exposed rock-slabs, nor the almost stone-hard, barren, pebble plains, nor the shores of the lakes, which by the agency of moisture have become covered by a scanty coating of moss, afford to vegetables a soil sufficiently fruitful to resist the rigour of the climate. The number of different species that enriched the herbaria of our botanists (Messrs. Fries and Berggren) was accordingly but small, though of great interest to botanical geography, especially as regards cryptogamia. The same may be said of the island's land-fauna. The species of birds that hatch on the coasts of the island were already previously very perfectly known, and the list of the island's birds could therefore only be augmented with but one Loxia species, met with on the northern coast. The class of insects in more southerly climates, so rich in various forms, is here represented by a few insignificant species, not including a single Coleopteron, but remarkably enough belonging, almost without exception, to new and peculiar forms. Here, as in Spitzbergen, no land-snails are to be met with; nor could our zoologists, by dragging in the ponds, discover a single species of Pisidium; but they found numerous shoals of fresh-water Crustacea, often of comparatively very considerable size.

The marine fauna, however, to which we shall hereafter return, and the geology, offered the richest and most interesting harvests. Keilhau had already brought home from Beeren Island some few Brachiopoda, belonging to the mountain-limestone, which were afterwards described by L. v. Buch; and he has moreover given some notices of the coal-strata, which show themselves in the northern part of the island. It was not, however, possible, from his account, to determine with certitude the geological age of these coal-strata; and there was among the specimens brought home no impression of plants from which one might infer the character of the flora prevailing in former ages in these tracts. The ascertaining of this was one of the chief objects of the scientific part of the expedition, and we were so fortunate as to find in the clay-slate strata, among or between the coal-beds, numerous impressions of calamites, lepidodendron, &c., which, together with the fossil plants which we subsequently found in Ice-fjord and King's Bay, have been already sent for examination to Professor Oswald Heer of Zurich. From the strata lying over the coal, large quantities of Spirifer, Productus, &c., were collected; and, by means of the profile exposed at the coast of the island, we were enabled fully to ascertain the principal features of its geological formation. Some mineral discoveries were also made, among which may be named the re-discovery of the very inconsiderable veins of lead-ore and blende, which, on the first discovery of the island, gained it, we need not say, an undeserved reputation for mineral wealth. The coal-strata are, on the contrary, considerable, and probably extend far under the sea to the north. They may possibly at some future period, when the development of industry requires the discovery of fresh treasures of coal in the bowels of the earth, become practically valuable, though, on the other hand, the island's northerly situation, and more especially its want of a harbour, will probably long hinder the working of these coal-mines.

The expedition left Beeren Island on the 27th of July. Our course was directed to the eastern coast of Spitzbergen, which had not been visited by any of the previous Swedish expeditions; but already at South Cape we met with ice, which, as we approached the Thousand Isles, became more and more abundant, and we were obliged to turn back. After some hesitation as to whether we should wait at South Cape till the water became more free from ice, in order to proceed further eastward, or immediately begin the scientific operations on the west coast of Spitzbergen that entered into the plan of the voyage, we embraced the latter alternative; and it was very fortunate that we did so, for on our return home we learned that the east coast, during the whole summer of 1868, had been rendered completely inaccessible by the ice.

Our course was now directed to Ice-fjord, where the *Sofia* cast anchor on the morning of the 31st of July. We continued a fortnight in the different harbours of that extensive fjord, and penetrated, in our boat-excursions, to the innermost parts of the fjord's northern arm, which had not previously been visited by the Swedish expeditions. During this time all the members of the expedition were busily occupied in scientific researches, and in collecting objects of natural history. The change was, indeed, advantageous, as well for our zoological and botanical as especially for our geological investigations.

The previous Swedish expeditions had pretty fully explored the principal features of the geology of Ice-fjord, and had found it, in consequence of the varying strata on its shores, full of different types both of animal and vegetable remains, and unusually rich in materials illustrative of the geological history of the extreme north.

Innermost in the fjord are found immense, probably Devonian, beds of red clay-slate, and sandstone, which, however, do not here contain petrifactions. On them lie strata of limestone, gypsum, and flint, filled with large coarse-scaled mountain-limestone Brachiopoda; then come *Trias* beds, with large nautilus-forms and remains of Saurians; after these, *Jura* strata with *Ammonites;* then *Tertiary* strata, in many places rich in plant-impressions, indicating a formerly temperate climate; and, lastly, scanty remains of *Post-tertiary* strata, with plant-fragments and sub-fossil marine shells, *some of which now first occur in living condition in the northern parts of Norway.* The preceding Swedish expeditions had brought home specimens from all these strata;* not, however, sufficiently numerous to give a geological representation of the place's former history so complete as the importance of the subject requires. To supply this defect, was one of the chief objects of the expedition of 1868; and we succeeded in bringing home unusually rich collections, especially of plant-impressions and trias petrifactions, which, when duly studied, will, no doubt, throw much light on the condition of the climate and arrangement of the land of the arctic regions at that remote period.

Spitzbergen, as is generally known, is at present frequently visited by Norwegian ships engaged in walrus and seal fishing, or in fishing for the "haakjoering" (*Scymnus microcephalus*) on the banks beside the island's coast. The walrus is, however, now but very rarely met with on the western side of Spitzbergen; and its fjords are therefore only occasionally visited for the purpose of taking in water or hunting the reindeer. On how large a scale the hunting of these animals may be carried, is evidenced by the circumstance that the vessels fitted out from Tromsö alone in 1868, according to official returns, killed

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* The first mountain-limestone petrifactions in Spitzbergen were found by Parry in 1827 at Cape Fanshawe, and the same year by Keilhau at South Cape. Jura fossils were first discovered by Lovén in 1838; the tertiary plant-remains by Nordenskiöld in the Swedish expedition of 1858; the Trias strata by Blomstrand in 1861; the post-tertiary beds, containing Mytilus, by Torell, Malmgren and Blomstrand in 1861; the Saurian strata by Nordenskiöld in 1864.

996 head. From Hammerfest the returns are still greater; whence one may conclude that, in spite of the war of extermination which, under the name of hunting, has for some time been carried on against these animals, two or three thousand head are annually slaughtered. If we compare that number with the scanty extent of ice-free meadow-land in Spitzbergen, we are tempted to suppose that an immigration must take place from Novaja Zembla, which, nevertheless, is scarcely possible, unless some large island or group of islands facilitate the communication between these two countries, situated at a distance of between 400 and 500 sea miles from one another. Of late years the Norwegians have resumed the method, formerly employed by the Russians, of using large nets, formed of rope, to catch the Beluga (*Delphinopterus leucas*); and in 1868 several vessels were fitted out exclusively for that species of fishing. Some of the fishermen whom we met had, on one or two occasions, taken from twelve to twenty head at a single drag of the net: right handsome sport, when one considers that the *Delphinopterus* is often larger than the walrus itself.

Ice-fjord, like most of the other gulfs of Spitzbergen, is surrounded by vast glaciers with their mouths turned towards the sea, which offer to the geologist an opportunity of studying that important phenomenon in the history of the earth's development. But also extensive valleys or declivities free from ice and snow are met with, especially in the inner parts of the fjord, and the fertile soil here produces a vegetation more luxuriant than in other parts of this island group. One may here see whole fields yellow with poppies (*Papaver medicante*), or covered with a thick green and red carpet of the beautiful *Saxifraga oppositifolia*. The fjord, which lies beneath them, and in the summer months is often as still and clear as a looking-glass, abounds with marine animals of various kinds. Everything contributes to make this a most important spot for the study of both animal and vegetable life in the Arctic regions. The zoologists and botanists of this expedition here gathered a rich harvest; among the results of which we may mention the taking of several fine salmon, and fully-developed examples of the esculent mushroom, &c.

We left Ice-fjord on the 13th of August. At the entrance a boat-party was sent out northward, to map and examine geologically Foreland Sound. Their work was now—as during the expedition of 1861, when Blomstrand and Dunér sailed through the sound—rendered difficult by almost perpetual fog. During this time the vessel made a somewhat longer excursion westward for the purpose of making soundings; which, however, was on this occasion rendered almost impossible by the heavy swell. We had arranged to meet at King's Bay, whither both parties came on the 17th, in the afternoon. Several zoological, botanical, and geological excursions having been made from this point, and a large number of miocene fossil plants collected, the *Sofia*, on the 19th, proceeded on her course further northward.

We had hoped here, in some degree at least, to reinforce our already considerably diminished stock of coal, but we soon found that that would necessarily cause too great a delay. In fact, whereas, more to the south, the tertiary formation occupies the greater part of the extensive peninsula between Ice-fjord and Bel Sound, and there in many places forms mountains of above a thousand feet high, at King's Bay, on the contrary, its extent is very inconsiderable, so that at present it forms only a few small hills consisting of strongly-folded strata, and separated from each other by the furrows cut by the glacier-streams. By this the supplies of coal, notwithstanding the by no means inconsiderable thickness of the beds and their accessibility (they lie only a few hundred feet from the shore of one of the best harbours in Spitzbergen), become of but little value, especially as the frost, which begins at a very short distance under the surface, renders the breaking of them extremely difficult; in fact, in consequence of the ice-drenched coal's extreme toughness, almost impossible without regular mining. It is even to be expected that the whole of what still remains of the miocene formation at this spot will, in a comparatively short period, be washed away.

Late at night, on the 20th August, the *Sofia* anchored at Amsterdam Island, and the following day we had the pleasure of hailing the first of the ships which had been hired in Norway for the expedition for the transport of coals. A coal depôt having been established on the low tongue of land that shoots out south-eastward from Amsterdam Island, and five of the scientific members of the expedition having been, together with necessary tents and boats, landed at Kobbe Bay, to prosecute there their zoological, botanical, and physiological researches, the *Sofia* sailed off with the rest on a sounding-tour towards Greenland. Our intention was to penetrate thither along the 80th degree of N. latitude, but before we had reached the longitude of Greenwich we were met by impassable masses of drift-ice. It was evident that the coast of Greenland was accessible only at a latitude much lower than was compatible with the plan of our voyage. We therefore turned our course north and north-east, and gradually, after innumerable zigzags in the ice, arrived at 81° 16′ N. latitude. The temperature had now sunk to 6° (centigr.), with thick ice, fogs, and snow-storms. The ocean was sometimes covered with a thin coating of new ice, and the old ice northward was quite impassable, so that we were obliged to seek a passage out in a south-easterly direction. After another vain attempt to reach Depôt Point, in Brandewijne Bay, the *Sofia* anchored, on the 29th, in Liefde Bay.

During the passage of the *Sofia* from Norway to Spitzbergen, its officers, Captain Baron von Otter and Lieutenant Palander, took a number of soundings in the deeper parts with a "Bulldog" apparatus of the same kind as that constructed at Tromsö, by Torell and Chydenius, for the voyage of 1861, and which was found to be particularly applicable. These soundings were zealously continued during our cruising amid the drift-ice between 80° and 82°, and gave very interesting results not only as regards the ocean's depth in the parts visited by us, but also concerning Arctic animal life at the greatest measurable depths. It showed us that Spitzbergen may in a manner be looked upon as a continuation of the Scandinavian peninsula, inasmuch as that island-group is not separated from Norway by any very deep channel (not above 300 fathoms), whereas a little to the north and west of Spitzbergen there is a depth of 2000 fathoms and more. From these great depths specimens of clay were brought up by the Bulldog-apparatus, which, on immediate and close examination, were found to contain not only several microscopic, but even larger and tolerably highly-organised animal forms (*e.g.*, several kinds of crustacea and annellata). The greatest depth from which any specimen was procured was 2600 fathoms, and the mass there raised consisted for the greatest part of white and red Foraminifera, in general scarcely so large as a pin's head. It is, moreover, deserving of remark, that, during our cruisings amidst the ice, we met with and collected, not only a number of pieces of drifting wood, but also (as, for example, at 80° 40′ E.) glass balls of the kind used by the Norsemen at their Loffoden fisheries for floats; an additional proof of the already well-established fact * that the Gulf Stream reaches, though in a greatly weakened state, even these tracts.

Liefde Bay had never before been visited by any scientific expedition, and its topography and geology were accordingly entirely unknown. A boat-party, consisting of Malmgren, Nordenskiöld, and Nyström, with three men, were therefore left here, while the ship went to fetch their comrades who had been left at Kobbe Bay. The boat's journey was favoured by calm and mild weather and a clear sky; although a high wind, accompanied by snow-storms, prevailed out at sea—a circumstance very common at Spitzbergen, and which is said especially to characterise that beautiful and, according to the unanimous testimony of the fishermen, appropriately named fjord. We were thus enabled, during the few days that our boat-voyage lasted, to map it, and ascertain the character of its somewhat uniform geology. Its shores are occupied exclusively by the same red, green, and dark grey kinds of slate, which in Ice-fjord are covered by mountain-limestone strata with *Producti*, and in Mount Hecla form the uppermost stratum of the vast series of schists to which the name of that mountain has been applied. But, as yet, no petrifications had been discovered in these strata. Their age was accordingly somewhat doubtful, and the probably Devonian fish-remains which we now found here are therefore a discovery of great value in the explanation of Spitzbergen's geology. The lower slate-beds contained some vegetable remains, though probably of too indistinct a character to admit of identification.

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* Among the already given proofs of this may be mentioned, that Torell, in 1861, at Shoal Point, met with a bean that had come from the Gulf of Mexico, the *Entada gigantilobium*.

On the 2nd of September, the boat's company and the ship, returning with our comrades from Kobbe Bay, met at a little distance off the promontory that separates Wijde Bay and Liebde Bay. After remaining in that bay a couple of days longer, the *Sofia* weighed anchor and touched at the now ice-free Cape Depôt, in Brandewijne Bay, in order to fetch away the supply of pemmican that (in 1861) had been left there, an iron boat, &c. We thence steered northward, with the intention of passing round Nordostland to Giles' Land. The greatest part of the arm of the sea, that lies between the Seven Islands, Cape Platen and North Cape, which, in 1861, was already, in the middle of August, perfectly free from ice, we now, in the beginning of September, found covered with a firm crust of ice. It was therefore impossible to reach Giles' Land by this route, and we were therefore obliged, after having, for the purpose of botanical and zoological researches, remained a short time at Castrén's Islands and Parry's Island, which last, being still encompassed by a girdle of land-ice, was approachable only by walking over the ice, to seek another passage, namely, that through Hinlopen Strait. Our course was directed to its southern part.

Already, before the end of September, some signs of the approach of autumn had been visible, and the hill-tops had frequently in the morning been for some time covered with a white mantle of new-fallen snow, which, however, had melted away again without causing any hindrance to our scientific pursuits. But now, during our passage to South Waijgats

Islands, a copious fall of snow rendered all further researches in natural history on land impossible, and gave us pretty clearly to understand that the season for our purely scientific pursuits was to be considered as at an end. We accordingly turned back at Mount Lovén, in the southern part of Hinlopen Strait, having first on that spot collected, from under snow of a foot deep, an additional number of mountain-limestone petrifactions. On the 12th of September we again anchored at our coal-depôt on Amsterdam Island, and there met our second coal-ship, by which some of the members of the expedition (Fries, Holmgren, Malmgren, Nauckhoff, and Smitt) returned to Norway, carrying with them the valuable collections of objects of natural history which the expedition had up to that time succeeded in acquiring. These collections have now happily arrived in Stockholm, and will, after having been duly studied, be divided between the National Museum in that city, where already the extraordinary rich Arctic collections formed by the preceding Swedish expeditions are preserved, and the Museum of Göteborg, the city whose liberal initiative first gave occasion to the new expedition. To give an idea of the extent of these collections, I need only refer to the notices above given of our geological operations, and remark that the zoological sciences were represented by no less than three members of the expedition, who, besides, had with them a taxidermist. Messrs. Malmgren and Smitt had also at their disposal a boat manned with four men for dredging every day, holidays excepted, when the ship lay still. They were thus enabled not only to make a searching examination of the Arctic marine fauna, which, in individual copiousness at least, is comparable with that of many more southern countries, but also to pay due attention to the terrestrial fauna of the locality, more especially the entomological branch, which is poor both with respect to individuals and species, and accordingly presented special difficulties to its investigator Mr. Holmgren. The dredgings also yielded rich contributions to the ocean's alga-flora. Every opportunity that offered itself for land-excursions was used by the two botanists of the expedition, both for investigating the flora and for forming a collection of specimens for normal herbaria of Spitzbergen's phanerogamia, mosses, lichens, and algæ.

On the 16th of September we took leave of our homeward-bound companions, and immediately proceeded northward. Our intention was to touch at the Seven Isles, but these were now found to be still more thickly surrounded by ice than when we had visited that tract about a fortnight before. We accordingly determined to avail ourselves of a channel tolerably free from ice, stretching northward from those islands.

After a number of zigzags amidst the drift-ice, our vessel, in longitude 17½° E. from Greenwich, succeeded in arriving at 81° 42′ N. latitude, probably the highest northern latitude a ship has ever yet attained. Northward lay vast ice-masses, it is true as yet broken, but still so closely packed that not even a boat could pass forward, and we were therefore obliged to turn to the south-west and seek for another opening in the ice; but we found, on the contrary, that the limit of the ice stretched itself more and more to the south the more we went to the west, so that, on the 23rd September, in the longitude of Greenwich, we were south of the parallel of 79° N. latitude. On the way we had in several places met with ice black with stones, gravel, and earth, which would seem to indicate the existence of land still further north.

The ice itself had, moreover, a very different appearance from that which we had met in these tracts at the end of August. It consisted now, not only of larger ice-fields, but also of huge ice-blocks, so that it seems as if the former ice had drifted to the south, and given place to new ice-masses coming from the north. The temperature had now sunk to 8° or 9° (centigr.) below the freezing-point, and the ice, which in these parts had before been of tolerably loose texture, had now become so compact that any more violent collision with it was combined with no little danger. Furthermore, the nights were now so dark that it was necessary at that time to lay the ship to by the side of some large sheet of ice, at the hazard of finding oneself blocked up there in the morning. Already, in the beginning of September, the surface of the ocean, after a somewhat heavy fall of snow, had shown itself, between the ice-masses, covered with a coating of ice, which, however, was then thin, and scarcely hindered the vessel's progress. Now it was so thick that it was not without difficulty that a way could be forced through it. All things clearly indicated that the season of the year, during which it is possible to sail in these tracts, was nearly at an end, and as we intended to make yet another attempt to find a north passage from the Seven Isles, or seek a harbour for the winter, we determined to return to our coal-depôt.

On the 25th of September the *Sofia* once more cast anchor at the north-west corner of Spitzbergen, after having slightly struck upon a rock situated under the surface of the water in the middle of South-gat, and which has been forgotten in Buchan and Franklin's admirable chart of that harbour, although it appears, from Beechy's description, that they themselves happened to strike on the same shallow.

After a few days' rest, spent in inspecting the engine and taking in coal (the last remains of our store of coals had to be searched for under a thick covering of snow), and after having placed in the letter-box on the island in Kobbe Bay notices of our journey and our plans for the future, we steamed away again, on the 1st of October, northward, notwithstanding a strong wind and a snow-fog that prevailed in the harbour we left. Our suspicion that this was only local seemed to be confirmed when we got out a little further north, as the weather became clearer and calmer, but at the same time we met already, in lat. 80° 40′, sporadic blocks of drift-ice, which, as we proceeded further north, increased in number and size. We continued our northward course during the following day, but it was soon evident that no open water would be arrived at that way, and in the afternoon we were again steering in a southerly direction. During the night we lay to under cover of a large sheet of ice. The temperature had now sunk to 14° 5′ (centigr.), so that in calm weather the surface of the water between the ice-masses was covered with ice of two or three inches' thickness, which considerably impeded the progress of the ship. On the following day we steered southward till we got into something like open water, and then followed the edge of the ice in a northerly and north-westerly direction. By this means we again arrived at 81° N. lat., but here the *Sofia* met with a misfortune, which put an end to all further efforts to proceed northward. In the morning of the 4th of October, during a storm from the south-east, and with a high sea, the ship was thrown violently upon a huge ice-block, or rather a small iceberg, whereby she sprang an extensive leak. We were therefore forced to turn back immediately and seek our harbour, where we arrived late in the evening, after eleven hours of incessant labour to keep the vessel free from water. Nevertheless, though all took part in this work, the water continually rose, so that, when the anchor was cast at Amsterdam Island, it stood about 2 ft. over the cabin floor. Fortunately the provisions, being kept between water-tight bulk-heads, were uninjured, and we succeeded, though with great difficulty, in keeping the engine-room so free from water that the fires were not extinguished. Had this not been the case, our ship must unquestionably, in a short time, have been the prey of the storm and the extremely heavy sea, which now, contrary to our former experience, raged among the thinly-scattered fields of drift-ice. Immediately on our arrival at Amsterdam Island the ship was careened and the leak provisionally stopped, so that already the next day we were in a condition to seek a more secure harbour in King's Bay. Here the ship was hauled so close to land at flood, that we, at ebb, were enabled to come at the leak and stop it effectually.

King's Bay, which in summer time is almost free from ice, was now filled with innumerable ice-blocks fallen from the mighty glaciers of the fjord, which, when carried by the flood-tide in towards land, totally barricaded the harbour in which the *Sofia* had taken refuge; and, notwithstanding that the temperature here was considerably higher than in the neighbourhood of 81° N. lat., these blocks froze during the calm weather so fast together, that when we, on the 12th of October, were again in a condition to sail, it was only with the utmost difficulty that our vessel could get out.

Our stay in King's Bay, like all the preceding occasions on which the ship remained any length of time still, was taken advantage of by our Natural Philosopher Dr. Lemstrom, for the purpose of making observations for the determination of the magnetic constants and variations. The ground was, however, too deeply covered with snow to allow of any geological or botanical operations. Even the brooks, so copiously supplied with water in the summer time, which intersect the lowlands adjoining the coal harbour, were now so entirely dried up by the effect of the cold that we endeavoured in vain to reinforce our now considerably reduced supply of water.

Our ship, which had had two ribs broken by the blow that caused the leak, was now too weak to be exposed, with the slightest prospect of success, in any new attempt to force a way through fields of drift-ice, as would in all probability be necessary, should we endeavour to visit the Seven Islands, which place we had intended to make our winter harbour; and the wintering in any other part of Spitzbergen not having either entered into the plan of our voyage, nor promising any results commensurable with the costs, dangers, and hardships of passing the winter there, we determined to return to Norway. But yet we wished to make an attempt to reach Giles' Land round the southern point of Spitzbergen, which was probably still free from ice. Already during our passage along the west coast of Spitzbergen, which in summer is entirely free from ice, we passed large though scattered fields of ice, which farther to the east, near the Thousand Isles, completely obstructed the way. We were, therefore, constrained to relinquish that plan also, and to direct our course towards Norway. After having been once more, on the shallow banks off Beeren Island, during a severe storm and in a high sea rendered to the last degree boisterous by the shallowness of the water, in great danger of being ice-beset, the *Sofia* anchored again on the 20th of October in Tromsö Harbour, where we had the pleasure of learning that our comrades had happily arrived and reached home in safety.

From the above it appears that the expedition, as regards its second object—namely, hydrographical investigations in the Polar Basin—did not succeed in reaching any remarkably high degree of latitude; so that the compass of the portion of our globe that is known to us, has not been to any material amount increased by it. I hope, however, that it has afforded a by no means unimportant contribution to the solution of the so-called Polar question.

A lively controversy has, as is generally known, been of late years carried on between the principal geographical authorities concerning the real character of the Polar Basin, some geographers maintaining that it is covered by an unbroken surface of ice, presenting an impassable barrier to the progress of a ship; while others look upon this as only an obsolete prejudice, arising in a great measure from exaggerated descriptions of the difficulties which the sailor encountered at the point where he turned back. That this latter view, at least as regards that portion of the Polar Basin that borders on Europe during the actual sailing-season in the Northern Seas, *i.e.* the summer, is not in conformity with the real fact, has been proved, not only by the adventurous journeys of the older Arctic travellers, but by a number of expeditions sent out during the last century for the exclusive purpose of such investigations, among which may be mentioned :—

Tschitschagoff's 1st	expedition,	1765,	which with their ship could only reach	80°	21′	N. lat.
" 2nd	"	1766,	which reached	80	28	"
Phipps'	"	1773,	"	80	37	"
Buchan and Franklin's	"	1818,	"	80	34	"
Scoresby's	"	1806,	"	81	30	"
Sabine and Clavering's	"	1823,	"	80	20	"
Parry's	"	1827,	"	81	6[*]	"
Torell's	"	1861,	" about	80	30[†]	"

It might then have been considered as already absolutely decided that it was not possible at that season of the year to penetrate very far into the Polar Basin, and any repetition *at the above-named season of the year* of these attempts could therefore only be looked upon as continually treading in old footsteps, which demonstrably do not lead to the intended object. But one doubt remained. At the season of the year when, in consequence of the heat of the summer and the influence of the ocean-waves and ocean-streams, the ice-masses have been reduced to their minimum—that is to say, in the autumn, before the formation of the new ice, no ship had ever before visited the Polar Basin. One could with certainty foresee that it might then be possible to go farther than in summer. There was a possibility that one might at that season be able to penetrate very far, perhaps to some land lying north of Spitzbergen, which might hereafter serve as base from whence to push still farther onward. These considerations constituted the ground for the plan of operations of the latter portion of the Swedish expedition, and it may now be considered as proved.

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[*] By ship, but on the ice the party penetrated to 82° 45′.

[†] By ship, but in boats and by land journeys as far as 80° 45′.

That one may, during autumn, reach by ship a latitude considerably higher than that which has been attained by most of the summer expeditions is possible; if this year had not been unusually unfavourable with regard to the condition of the ice, we might in all probability have proceeded a considerable distance farther, perhaps beyond 83° N. lat. But we have at the same time convinced ourselves that, even in autumn, further progress is soon rendered impossible by impenetrable masses of broken ice. The voyage itself, moreover, at that season of the year, in consequence of the cold, the darkness, and the boisterous winds, accompanied by snow-storms that at that time of the year are prevalent in the Polar Basin, and the heavy sea amidst masses of drift-ice caused by these latter, is rendered so dangerous that the risk to which the traveller exposes himself is far from being compensated by the meagre prospect of success. The idea itself of an open Polar Sea is evidently a mere hypothesis, destitute of all foundation in the experience which has already by very considerable sacrifices been gained; and the only way to approach the Pole, which can be attempted with any probability of succeeding, is that proposed by the most celebrated Arctic authorities of England, viz., that of—after having passed the winter at the Seven Islands, or at Smith Sound—continuing the journey towards the North on sledges in the spring.

IX.—*Report of the Trans-Himalayan Explorations during* 1867. By Captain T. G. MONTGOMERIE, R.E., of the Great Trigonometrical Survey. From the Original Journals, &c., of the Trans-Himalayan Exploring Parties.

Read, April 12, 1869.

THE Trans-Himalayan explorations made during 1865-66 from the Mansarowar Lake to Lhasa, supplied various pieces of information as to routes and places in Tibet of which the names were unknown in India. Tibetans had been heard to talk of their gold mines and salt mines, and the position of some of the latter was indicated roughly on European maps; but our knowledge of all such places was vague in the extreme, though the Tibetans certainly do bring both gold and salt. The first Pundit heard of these places whilst in Lhasa, and the second Pundit, when at the Gartok Fair, heard various particulars, from which he gathered that the route to those gold-fields east of Gartok was likely to be feasible.

It will be remembered that the second Pundit made his way to Gartok in 1865 by one route, and returned by another; thus connecting that place with points in British territory on the south that had been fixed by regular survey. There, however, still remained a large gap between Gartok and the Ladak territory, which latter had also been surveyed. It appeared to me very desirable that this gap should be filled up, the more especially as it embraced a portion of what was said to be the course of the great River Indus, a portion, moreover, that had never been traversed by any European.

The information I received, during the prosecution of the survey of Ladak, as to the Indus, led me to think that there was a large eastern branch of that river, and I was confirmed in that opinion by the reports of the surveyors who sketched the extreme south-east of Ladak.

Owing to the great jealousy of the Tibetans the surveyors could not make their way very far beyond the frontier; the fact of their being engaged on the survey of Ladak arousing the suspicions of the Tartars so much that a regular watch was established the moment a surveyor approached the frontier. Nevertheless the ground was sketched to some distance beyond, and peaks were fixed at a still farther distance by the theodolite.

The natives pointed out the position where the eastern branch came in, and a gap seen in the mountains in that direction made its existence highly probable. Having this information, it seemed to me very desirable that the question as to the existence or non-existence of this branch should be settled. I consequently determined that the second expedition of the Pundits should be in that direction: the first object being to settle various doubtful points as to the position of the Upper Basin of the Sutlej; the second object, the question of the eastern branch of the Indus; the third, the connection of Gartok with the regular survey in Ladak, and the fourth, to explore up to the gold and salt mines east of Gartok, and as far beyond as the Pundits could get in an easterly direction. The latter being with a view to gain some knowledge of the vast terra incognita lying between the desert of Gobi and Lhasa. Preparations for the expedition were made during the spring of 1867. A third Pundit was entertained and trained to supplement the place of the second Pundit, who had proved to be somewhat wanting in nerve. Starting from Mussoorie on the 2nd of May, the party under the first Pundit reached Badrinath on the 24th of May, and Mana on the 3rd June. The Mana Pass to the north had not been declared open, and the party had consequently to wait at Mana. Whilst there several heavy falls of snow occurred on the neighbouring mountains.

The Pundit found that, before his party could cross into Tibet, it was necessary that the opening of the pass should be formally notified by the Tibetan officials; and, before this is done, the Jongpon (or Zungpung) of Chaprang makes inquiry every year as to the political and sanatory condition of Hindustan. The inquiry seems to be carried out with all that assumption of lofty superiority for which Chinese officials are famous. Looking down from their elevated plateaux, they decide as to whether Hindustan is a fit country to have intercourse with. The decision come to appears not to be at all a dead letter, for, as will be seen hereafter, it ultimately affected the Pundit's movements not a little. The especial inquiries made are as to whether there is war, epidemic, famine, &c., such as are in any way likely to affect Tibet.

During his stay at Mana the Pundit made complete arrangements for their journey, and he gave the third Pundit some farther practice in route-surveying. Whilst there he was also fortunate enough to secure the services of three men, viz., of a Bisáhiri trader, a resident of Badrinath, and a Ladaki trader from Zaskar. All these men knew the routes to the gold and salt mines east of Gartok. They proved, moreover, exceedingly useful in collecting provisions, servants, and asses; the latter for the carriage of the small parcels of merchandize which formed the ostensible object of their journey. On the whole the halt at Mana was a decided gain to the party.

At length, on the 9th of July, three men, sent by the Jongpon of Chuprang, arrived, and, having made all their inquiries, declared the Mana Pass open to traders from Gurhwal. The party accordingly was able to commence its march on the 26th July. It consisted of eleven men, twelve asses, and one pony, the men being all armed with weapons they had borrowed at Badrinath, as they were told that arms would be required to keep off robbers. On the 28th they crossed the Himalayas by the Mana Pass (18,570 feet), and on the 29th July reached Lumarti Camp. Here they were told to halt until more traders joined them, so that the Tibetan officials might be saved trouble by examining and taxing a number at the same time. The second Pundit, however, was sent on ahead to intercede with the Chuprang Jongpon, and he succeeded in getting authority for the party to advance alone. Churkong is the place where traders are generally taxed, but in this instance the examination was made at Barku. The Abtuk of Chuprang searched the baggage, fortunately without discovering the instruments; and, being satisfied that the party was a trading one, he levied the taxes at the usual rates.

On the 6th August the party reached Totling, passing the small town of Chuprang on their left (north). At Totling they put up in the monastery, the monks (Gelongs or Dabas) allowing all travellers to do so. The monastery, with its numerous dykes of stones is about one mile in circumference; it has fifty to sixty monks attached to it, the head one bearing the title of Ling-Khambo. Between Mana and Totling there is no cultivation of any kind, but at Totling itself a grain called nai (barley) is sown in April, and reaped in September. From Totling the party advanced direct towards Gartok, crossing the Sutlej by a remarkable iron suspension bridge 76 feet span, 7 feet wide, and about 40 feet above the water. The chains are formed by links of iron, of the shape of the figure 8, each about one foot in length, the iron being over one inch square. The bridge is said to have been built by Gyalpo Kesar or Sekundar Badshah (Alexander the Great!) The iron is in capital preservation, owing to the very small rainfall, and to the care with which it is annually lubricated with butter (ghee.)

After crossing the Sutlej, the Pundit and his party all assumed the costume worn by Bisáhiri traders.

On the 9th August they crossed the watershed between the Sutlej and the Indus by the Bogola Pass, 19,220 feet above the sea, and reached Gugti Camp, close to Gartok, on the 11th instant, avoiding the latter place, lest its officials should in any way interfere with their onward progress. Continuing their journey they ascended the mountains east of Gartok, and, after crossing the Gugti-la Pass, 19,500 feet above the sea, they found themselves on the 14th August on a vast desolate plateau, the lowest points of which they ascertained to be 15,280 feet above the sea.

This plateau is called Chojothol or Antelope Plain, from the great number of those animals seen on it. On the 16th they reached a small lake, covered with ducks and other wild fowl. On a-head no signs of a path, or of either houses or tents, were to be seen, and the party became anxious as to fresh water, which was said to be very scarce. It was not till the evening of the second day that they came upon fresh water.

Several very brackish lakes were passed, so intensely salt that even the wild fowl avoided them. No potable water could be got till they found a glacier and melted its ice.

On the 10th they crossed the Pabha-la, 17,650 feet above the sea, and descended to the Giachuruff camp, on the banks of the Singh-gi-chu, or Indus River, 15,730 feet. After the desolate and arid table-land they had crossed, the sight of the river and its fresh water, and of the large camp beyond, was at first very pleasant to the Pundit's party; their pleasure was, however, soon damped, as they found the inhabitants of the camp very suspicious as to the object of their journey; their progress being for the first time impeded by the officials. Gopa Tajam, the head-man, questioned them as to the objects of their journey, and as to who and what they were, &c. When told that they were Bisáhiris, who had come there solely to sell coral and purchase shawl wool (pushm) in exchange, he told them flatly that he did not believe their story. With great correctness he then proceeded to point out the proper country of each individual, and said that if they had been really all Bisáhiris, and had been lately in Bisáhir, they would never have dared to enter Nari Khorsum that year, as an order had been promulgated at the time of opening the passes, forbidding Bisáhiris to enter the country on any account, as they had in the previous year introduced small-pox, which proved fatal to many of the inhabitants. The head-man, moreover, hinted that the party had introduced Europeans into the country.

These expressions being so strongly expressed, alarmed the Pundits, more especially as they never thought that the disguise of a Bisáhiri, which had served them so well on the route to Lhasa, would prove a hindrance on this occasion.

The Pundit thought these suspicions were due to the jealousy of an acquaintance of his, who lived near Badrinath. However, by repeated protestations, he managed to bring the head man round to a partial belief in their story, so that he at last consented to allow a portion of the party to proceed onwards, provided the remaining portion was left as a hostage for their good faith.

As the second Pundit's nerves were again considerably shaken by the dreary mountains they had crossed, and by the check they had received, the first Pundit decided to leave him at Giachuruff, whilst he and the third Pundit pushed on a-head, on the pretence of selling their coral. Whilst preparations for this purpose were being made, the head-man's suspicions began to gather again, and it was only after farther entreaties, accompanied by presents, that they were allowed to advance. The Pundit left the Giachuruff camp on the 22nd August with the third Pundit; but the latter was, very soon after starting, detached with one servant to carry a route-survey up the river Indus as far as he could get. The Pundit himself made a very long march, so as to get well clear of the Giachuruff people, and by night was far away to the east, resting near the bed of a small dry stream. On the 23rd of August he hoped to be able to cross the Chomorang Range, but owing to a very heavy fall of snow, he was obliged to halt at a camping-place below it. Snow continued to fall on the 24th and 25th, and he was not able to continue his march till the 26th of August, when he crossed the Chomorang-la Pass, 18,760 feet above the sea, and after a long march, crossing a good deal of snow, he reached the large camp of Thok-Jalung,* the chief gold-field of that part of the country.

As the Pundit descended the Chomorang-la Pass, the Thok-Jalung camp came in sight, he found it pitched in a large desolate plain, of which the prevailing colour was reddish brown. As far as he could see, it at first appeared to be like other Tibetan standing camps, except that it was very much larger. As he got closer he made out the noise of a great number of voices singing together, and on his arrival found that this came from the gold-diggers and their families, whilst the men were at work.

The Pundit had armed himself with a letter from the Giachuruff chief, and this he presented the next day to the Thok-Jalung chief, with a small present of the best Indian tobacco, which he had somehow discovered to be a particular weakness of that individual. The chief received the Pundit in his large tent; he was much gratified by the present, but in spite of that and the letter, it was evident from his manner that he did not think that matters were quite right. He cross-questioned the Pundit, and then advised him to do what he had to do in Thok-Jalung quickly, and to return to Giachuruff by the same road as he came. The chief said that it was out of his power to allow the Pundit to stay long, and that properly he ought to have sent him back at once, as there was an order in force forbidding all Bisáhiris to enter the country that year.

Hearing that the Pundit had coral for sale he asked to see it. As soon as it was displayed the chief's wife, who was present, took such a liking to it, that she persuaded the chief to offer gold in exchange. The Pundit thought his only chance was to acquiesce, and he did so, making, as he afterwards found out, a very bad bargain. Having given up his coral, the Pundit was allowed to retire.

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* See the map in Journal R. G. S., vol. 38, p. 129:

The chief was an inhabitant of Lhasa, called Yoodak Mingmár, about forty-five years of age. He had been master of the Thok-Jalung gold-fields * for some time. The Pundit saw him several times afterwards, and always found him very civil. His usual dress was a red robe of Lhasa or Shigatze manufacture, his head was covered with a brown felt hat, of Chinese fashion, with a broad rim turned up all round. He told the Pundit that he and every one else wore furs in the winter, and that they could not live at that season without them, which is no doubt correct, as the Pundit's observations made the gold-field to be at the great altitude of 16,330 feet above the sea. His tent was a large circular one, about 25 feet in diameter, with two poles; it was pitched in a wide pit some 7 or 8 feet below the surface of the ground, and the descent to it was by means of steps. Outside the Pundit noticed one of the gigantic black dogs of Lhasa. This beast was tied unpleasantly near the door, and was so savage that there was great difficulty in preventing him from flying on strangers. The Pundit had seen many of these dogs in Lhasa, and he at once recognised it by its great size, deep jowls, and the white mark on its chest. The Lhasa people call them Gya-ki, or royal dogs.

The tent was made of black yaks' hair; it contained bales of shawl-wool (pushm), leather packages of tea, strings of dried beef from the yak, and a few other Tibetan luxuries, such as dried apricots, currants, &c.; the poles were garnished with several match-locks and a sword. The chief's seat was beside a small box, in which there was a drawer containing paper, pen, ink, and a couple of cups or bowls, one for drinking tea, and the other for chung or whisky. The chief's tent seem to have also been the shrine of the camp, as behind his seat there were piled up the usual images, small brass bells, tiny vases, books, pictures,† lights, &c., that are carried about by wandering Budhist Lamas. Whether the chief was also a Lama was not ascertained; but his red dress, and the ritualistic instruments point to that conclusion.

The chief was constantly smoking a silver-mounted Nepalese hookah. Tea was forthcoming at all hours. He had about

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* From previous information it appears that gold was first discovered to be abundant at Thok-Jalung about eight or nine years ago.

† Quaintly painted on cloth, many of that kind can be seen in Ladak at the Hemis and other monasteries.

ten personal servants, who lived in small tents round about his own. The chief was a very intelligent man, and, all things considered, the Pundit thought him well informed. His shrewdness there was no mistaking, as instanced in the matter of the coral. He noticed the Pundit's box, examined it carefully, and then asked him how he came to have such a good box. The Pundit was fortunately ready with his answer, and said he bought it at one of the "Saheb logues" auctions, to carry his coral in. The fame of these auctions had reached even this Tibetan chief, and he expressed himself as quite satisfied, allowing the box to be removed, without discovering the large sextant, which was stowed away in a secret compartment. The chief took a great liking to the Pundit, and used to send for him every now and then, in order to discuss over tea and tobacco the great country down below.

The Pundit found the part of the gold-field that was being worked to be a great excavation from 10 to 200 paces in width and some 25 feet in depth, access to the bottom being by means of steps and slopes, the earth as dug out being thrown upon either side. The excavation at the time of the Pundit's visit was about a mile in length. The digging is carried on with a long-handled kind of spade, and occasionally with an iron hoe; the iron for these implements is brought from Bisáhir, Ladak, &c. The camp had a blacksmith who could repair these tools.

A very small stream runs through the gold-field, and the bottom of the excavation is consequently rather a quagmire during the day-time; but the stream is put to good use for washing the gold out of the soil. The diggers dam up the water and leave a sloping channel for it to escape by. A cloth is spread at the bottom of the channel and kept down by a number of stones so as to make the bottom uneven. One man brings earth from the excavation and sprinkles it over the channel, whilst another man drives water down the channel by means of a leather bag. The water carries the lighter soil right away, but the pieces of gold fall into the uneven places, and are easily collected in the cloth by lifting up the stones. The yield of gold seems to be large and the finds occasionally very heavy —the Pundit saw one nugget of about 2 lbs. weight (75 tolahs). The diggers say they can recognize the soil that contains gold at once; but, judging from the large number of gold-fields that have been used at one time around Thok-Jalung, and are now more or less abandoned, the Tibetan gold-diggers seem to be quite as capricious as those of Australia or California, and the probability is that whenever they are a long time without getting good finds they strike their camp and move off to what they think a more tempting field.

From what the Pundit heard during this last expedition and the previous one to Lhasa, there is a whole string of gold-fields extending all the way from Lhasa to Rudok along the route which must run close to the northern watershed of the Brahmaputra, probabably in the depression to the north of it. The gold-fields are carefully watched by the Lhasa authorities, a gold commissioner, called Sarpon,* superintends the whole of them, and each field has a separate master. Any individual is allowed to dig, provided he pays the annual tax of one sarshoo weight of gold, which is about ½ a tolah or ⅖ths of an ounce. The greater part of the diggers come from the Chung province around Shigatze. The gold commissioner makes an annual tour through the gold district, visiting each field and collecting the taxes.

The Pundit says that in all his travels he never experienced such intense cold as he did at Thok-Jalung, owing, as he thought, to the high cold wind that was always blowing, more than to the great elevation, viz., 16,330 feet above the sea. The tents of the diggers are always pitched in pits some 7 or 8 feet below the surface of the ground, so as to keep out the wind. Spite of the cold, the diggers prefer working in the winter; and the number of their tents, which in summer amounts to 300, rises to nearly 6000 in winter. They prefer the winter, as the frozen soil then stands well and is not likely to trouble them much by falling in.

The water near Thok-Jalung is so brackish that the diggers cannot drink it till it has been frozen and then re-melted. Considering these difficulties about water, the great elevation, the total absence of wood, and the general severity of the climate, gold-digging at Thok-Jalung is carried on under very much greater difficulties than in any other part of the world. Nevertheless the diggers appeared to be cheerful, and were constantly singing, their families joining in a sort of chorus, which could be heard at a great distance.

Argols of dried dung from the yaks, ponies, and sheep, &c., form the only fuel. The Tibetans cook and eat three times a day, their food consisting chiefly of boiled meat, barley cakes, butter-milk, and tea stewed with butter. The Pundit said the Tibetans all preferred China tea, and did not approve of Himálayan, tea spite of its price; they vowed the latter was too heating for them, and that only very poor folks take it.

There was no attempt at masonry in the whole camp; the only apology for it being a square churtan of dry stone, plastered with white earth, and surmounted with a pole and flag.

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* Sar is the Tibetan name for gold.

At the foot of the mountains round about, the diggers had collected 7 or 8 piles of white stones (probably quartz), and on the bare slopes they had also picked out with white stones the letters of the sacred sentence "om mani padmi hom," on such a gigantic scale that it could be read at a great distance. The sentence was repeated in this way over and over again.

The diggers all eat yaks' flesh, and they are said to get over their Tibetan scruples by strangling their tame yaks; but they, nevertheless, do not object to wild animals, yaks, asses, &c., that have been shot.

The Tibetans say that eating roasted meat impedes their breathing, and that fresh milk has the same effect; they consequently forbid both and invariably eat boiled meat, throwing away the water in which it is boiled and drinking butter-milk. They extract their butter (ghee) from the milk of yaks, goats, and sheep. Their tea is invariably stewed with butter. The meal they use is generally barley meal.

The position in which Tibetans sleep is a most extraordinary one; they invariably draw their knees close up to their heads, and rest on their knees and elbows, huddling every scrap of clothing they can muster on to their backs. Those who are better off rest in this manner on a sort of mattrass that rises towards the head; and the poorer people in standing camps generally manage to get a suitable slope on the mountain side, or to arrange stones and earth so as to rise in the same way; but rich and poor adopt the same position for sleeping. The Tibetans employed in Ladak by the Survey, though provided with tents (shouldaries) invariably slept in the way described above, arranging themselves in a circle round the tent. This position is most probably adopted in order to secure as much warmth as possible for the stomach, the thighs pressing against it and thoroughly excluding the external air. The gold-diggers smoke a great deal, using brass, zinc, or iron pipes, the latter being most common.

The Pundit mixed freely with the gold-diggers and observed all their ways and habits, but his time was limited. The chief, spite of his friendly conduct, insisting that he could not let him stay beyond the 31st of August. He ascertained that the price of the gold at Thok-Jalung was only Rs. 5½ to Rs. 6 in silver per saishoo (which weighs about a half tolah and 8 ruttees), or rather less than Rs. 30 per ounce. There were two tents belonging to goldsmiths in the camp; they came from the Chung or Shigatze province. Seeing no chance of extending his journey to the east of Thok-Jalung, the Pundit retraced his route to Giachuruff; there he found the 3rd Pundit, who had made his way for a considerable distance up the River Indus to a place called Jiachan.

Though the 3rd Pundit had heard that a large band of mounted robbers were wandering about the Upper Indus, he was in no way hindered by them till he reached Jiachan. There, however, whilst he was down at the river, a couple of armed robbers fell upon his servant, an oldish man, and knocked him over, seizing a thermometer and the coco-nut containing the supply of quicksilver. Fortunately the Pundit was not far away, and hearing the cries he rushed to the rescue, seizing one of the robbers by his pig-tail, he swung him round and took back the stolen things. This 3rd Pundit, being a tall, powerful man, completely turned the tables, and the robbers pretended that they had only been joking with the old man, and did not really mean to take anything. The robbers made off as soon as they could, and the 3rd Pundit, thinking they might bring down more of their brethren on him, decided to retrace his steps. He was very reluctant to do this, as, from all he could hear, 3 or 4 marches more at the outside would have taken him to the source of the Indus, which at the farthest point he visited was still a good-sized stream. He was, however, certain from the peculiar head-dress of the robbers that they belonged to the armed band he had been warned against—the head-dress being one peculiar to the nomadic inhabitants of the Shellifuk and Majin districts, who are noted as professional robbers.

The whole of the Pundit's party having been re-collected at Giarchuruff, he decided to trace the Indus down to its junction with the river upon which Gartok stands. Starting on the 4th September, they marched steadily down-stream, passing numerous camps, with their flocks and herds, but seeing no cultivation or villages till the 7th, when they came to a small village with the first patch of cultivation. All along the banks there was a low bushy jungle. The grass appears to have been abundant, and near one camp there was a herd of 500 or 600 horses or large ponies running almost wild, mostly of a white or a greyish colour. On the 12th September they reached the junction of the Indus and Gartok rivers, and, crossing the latter, encamped near the Lujan-Chumik spring.

From Lujan-Chumik the Pundit sent the 3rd Pundit to trace the river down into the Ladak territory, whilst he traced it up to Gartok. On the 14th September he reached Gar-Gunsa, the winter residence of the Gartok authorities. He found only three large and eight small houses in it, and was informed that the rest of the inhabitants lived in tents. All along the banks of the river he found the grass tall and luxuriant. The valley all the way up was flat and wide.

On the 16th September the Pundit reached Gartok,[*] where he found a camp of about 200 tents, mostly belonging to traders. On his arrival he was alarmed to find that some one had been spreading reports as to his being in British employment, and he found it advisable to hasten his return. Choosing a new route, he got separated from his baggage and the greater part of his party, and had he not fallen in with traders from Shipki, he would have been put to very great hardships. He crossed by the Laochia Pass, and marching by Shiang and Dunkhar, reached Totling on the 26th of September. Here they waited for the 3rd Pundit, who joined them on the 29th of September, after having traced the Indus down to Demchok, in Ladak. From Demchok he crossed from the basin of the Indus to that of the Sutlej by a very high pass, and carried a route-survey down to Totling.[†] From Totling the 2nd and 3rd Pundits were sent down the Sutlej to Shipki, tracing the river as closely as they could. From Shipki they carried a route-survey in a southerly direction, crossing the Himalayas by a high pass and descending to Nilung on the upper course of the Ganges.

The Pundit himself returned from Totling to Badrinath by nearly the same route as he advanced by, only making one small variation. Ultimately the 2nd and 3rd Pundits rejoined the 1st, and they all made their way down into British territory by the beginning of November.

The geographical results of the exploration can be seen at a glance from the map (in Journal, vol. 38). They account for the geography of about 18,000 square miles, founded on 850 miles of route-survey with 80 heights. The routes are checked by 190 latitude observations, taken at 75 different points.

The course of the Sutlej River has been roughly traced from Totling down to Shipki, on the border of British territory. Hitherto there has been no survey of any kind of this portion, and the route, though only actually touching the river for a short distance, was carried near enough to it to enable the Pundits to lay down its probable course very closely. The position of Gartok, as determined by the two routes of the last expedition, has been confirmed by a third route carried up from Badrinath.

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[*] Gártok is said to be a corruption of Gártod,—*tod* meaning "upper;" it is also called Gár Yár-Yársá,—Yársá meaning "summer abode," from *Yársa*, "summer," and *sá*, "abode." The winter-quarters are called Gár-Gunsá, from *Gunga*, "winter," and *sá*, "abode."

[†] The portion between Medokding and Totling was previously traversed by Captain Henry Strachey.

The mean of three gives a very good longitude of Gartok,[*] as has been proved by the farther route-survey carried from Gartok to Demchok, which latter had been previously fixed by the regular survey operations in Ladak; the longitude by the route-survey only differing from that of the regular survey by 2½ minutes—a very satisfactory result from a route-survey[†] traversing 160 miles direct over such a very rough tract of mountains.

The routes have also defined the courses of both the upper branches of the River Indus from near their sources to their junction, and the conjoint stream from that point into Ladak. Neither of these branches had been previously surveyed in any way, except a small portion of the Gartok branch above Gartok, which had been roughly laid down by Moorcroft.

The existence of the eastern branch was doubted by many geographers,[‡] as no Europeans had ever seen it. The Pundit's route has now proved that this eastern branch is the main stream known to the natives as Singh-gi-Chu or Singh-gi-Khamba (Lion's mouth), the River Indus itself, whilst the other branch, hitherto generally supposed to have been the main stream, is much smaller than the eastern one, and invariably called the Garjung-Chu.

The routes extended beyond the eastern watershed of the Indus as far as the great Thok-Jalung or Thok-Samba gold-field. Thok-Jalung was moreover roughly connected with various other gold-fields and salt-mines by means of information derived from travellers, and the general correctness of this information was roughly established by a route to Rudok, derived from similar information, which made out the position of that place tolerably close to that determined by the regular survey.

A number of lofty snowy peaks were determined from various stations of the route-survey, the most remarkable being the Aling-Gangri group north of the Indus, which, judging from the great mass of snow seen on the southern face during August and September, must be upwards of 23,000 feet above the sea, possibly

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[*] Gartok, longitude, E. 80° 23′ 33″; latitude, N. 31° 44′ 4″, and height 14,250 feet above sea.—T. G. M.

[†] The values of the pace, as tested by the differences of latitude, were very accordant, thus :—

	Difference latitude.	Deduced length of pace in feet.	REMARKS.
	° ′ ″		
From Badrinath to Gartok ..	0 59 36	2·495	By 1st Pundit.
„ Gartok to Thok-Jalung	0 40 23	2·512	„ 1st Pundit.
„ Gartok to Demchok ..	0 57 17	2·634	„ 1st and 3rd Pundits.
„ Demchok to Totling ..	1 13 24	2·495	„ 3rd Pundit.

T. G. M.

[‡] It was indicated from native information by H. Strachey, on his Map of Ladak and Gnair-Khorsum.

as much as 24,000 feet. The line of perpetual snow on the southern slopes of the Ladak Mountains approximates to 20,000 feet in the same latitude, and it would require several thousand feet of snow above that line in order to be very imposing at 80 miles, at which distance the Pundit first saw it. The Aling-Gangri group had never, as far as I am aware, been heard of before. They appear to be a continuation of the range between the Indus and the Pangkong Lake. The Pundit could see no farther continuation of the range to the east of Thok-Jalung. Another high group was seen to the east of the Medok-la, on the watershed between the Sutlej and Indus.

Altogether the Pundit and his brethren have, as I predicted, improved very much in the art of fixing distant peaks; satisfactory proof of this has been forthcoming from their back bearings to well-known peaks, such as Leo-Porgyal, Kamet, &c., which gave very accurate positions to those peaks, forming at the same time a valuable check on the route-surveys, and proving that there has been no large accumulation of error.

The numerous heights determined by the boiling-point give a good idea of the great elevation of the country traversed, and the consequently enormous difficulties under which the route-surveys were made. From them it will be seen that the Pundits were for more than three months at an elevation of over 13,000 feet. They crossed the great range between the Sutlej and the Indus three times—that between Gartok and Chajothol once, between Chajothal and Giachuruff once, the Chomorang Range twice, and the Himalaya Range three times, each of the crossings involving a pass of over 17,000 feet, two of them being over 19,000 feet.

The height of Gartok by the above is only 14,250 feet, instead of 15,000, as had previously been assigned to it. At the several points, Totling, &c., where Henry Strachey's heights were taken, the Pundit's heights are generally lower. A difference in the same direction was noted in the results of the previous expedition at a point near the Mansarowar lake; and, judging from the following comparisons, it appears to arise from a constant difference, probably due to the thermometer employed:—

	By the G. T. Survey. Feet.	By H. Strachey. Feet.
Hanle	14,276	14,500
Pangkong	13,936	14,300
Tangse	12,791	13,000
Diskit	9,950	10,400

The above shows that Captain H. Strachey's were generally higher than the G. T. S. values, by about 300 feet on the average; and the Pundit's values differing from Captain Strachey's by about the same amount, it may be concluded that they are tolerably near the mark, and at any rate not in excess.

The Pundit's heights agree with those of Badrinath, as determined by another observer.

During their journey from Mana to Thok-Jalung, a total distance of 207 miles, they only met with cultivation once, viz., near Totling on the Sutlej; everywhere else the mountains were too high to allow grain to grow. The mountains, however, produce plenty of coarse grass, sufficient to produce large flocks and herds, the Pundits coming across camps nearly every day.

The weather, until they reached the Chomorang Range, was good; there, however, the fall of snow, was very heavy, though it did not extend in any great quantity on the Thok-Jalung side. At Thok-Jalung itself only a little rain fell, though it was often cloudy.

During the whole of the time * the Pundit was on the Upper Indus there was a dense bank of clouds in the direction of the Kailas Peak, and, consequently, neither he nor the 3rd Pundit could ever get a bearing to that peak, though they were on the look-out to do so.

In spite of the desolate aspect of the mountains traversed, the number of wild animals was remarkable, quantities of Tibetan antelopes, wild asses (kiangs), yaks, grey wolves, hares and marmots. Wild fowl swarmed on some of the small lakes, and ravens used to visit the camp in pairs.

The actual source of the eastern branch or main stream of the Indus was not reached, but the people between Giachuruff and Jiacham said it rose at a place called Gangri-Goorgiap, which may perhaps refer to the Gangri or Kailas Peak; but the direction of the course of the Indus, as seen from near Jiachen, pointed rather to the east of that mountain. The whole district along the upper course of the Indus is called Bongthol, which is divided into the small districts (puttees) of the Singhtod and Singhmet. "Tod" signifying upper, and "Met" lower.

At the highest point visited the Indus was still a considerable stream. At Giachuruff the ford was always a difficult one, and for eight days after the fall of snow the Pundit experienced, the river was not fordable in any way. Whilst it was snowing on the Chomorang Range, heavy rain fell at Giachuruff, and the river, consequently, rose very much. The stream was

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* The rains were in full progress at this time on the outer Himalayan ranges.

generally very clear and full of fish[*] of all sizes, up to about 18 inches in length.

The 3rd Pundit, though a very tall powerful man, had great difficulty in crossing when the river was falling; he crossed over to catch their baggage-animals which were out grazing, but being delayed till dark he was unable to venture back, and was consequently kept out all night with hardly a scrap of clothing, he and his companions huddling together in order to keep themselves warm.

From Jiachan to Giachuruff the Indus flows through a rather broad, flat valley, and from Giachuruff to its junction with the Garjung-Chu it flows through a similar valley, the banks being lined in many places with long patches of low jungle. The Indus above the junction was from 100 to 200 paces in breadth, with a depth of 4 to 6 feet; while the Garjung-Chu was in places as much as 250 paces in width, but with a depth of only 1 to 2 feet. The Garjung-Chu between Gartok and the junction flows through a particularly broad and flat valley. The Indus below the junction flows through a wide valley to a considerable distance below Demchok.

When at Thok-Jalung the Pundit made diligent inquiry as to the adjacent countries; he was informed that a large district, called Majin, extended for nine days' journey to the east, and that a smaller district, called Shellifuk, lay to the south-east. The Majin country was said to be a difficult one to travel in, as no rivers ran through it. The Shellifuk district boasted of some streams, but they all run into a large inland lake.

Immediately to the north of the gold-fields there is no regularly inhabited country, as far as the Thok-Jalung people are aware. They say there are some wandering thieves, Champas or Khampas, who live entirely on meat, and have had so little acquaintance with grain in any shape that they get sick when they take it from their more southerly brethren. The Pundit, however, seemed to have very little faith in this part of the story. He heard that at a considerable distance to the north-east there was a tract called the Whor country, inhabited by Shakpo people, the same style of people as those who come from Jilung.[†] Tartary is said to be to the north-east of Whor. To the north-west of Thok-Jalung lies Rudok, the route to which has been roughly indicated on the map. Ting-Chu and Rawung are the intermediate districts; the first is a very cold place, and has very little sweet water, though plenty of brackish water. Rawung has much the same climate as Rudok, only slightly colder; it has, however, plenty of fresh water.

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[*] The Dokpa people eat these fish, but those Tibetans who have read Buddhist books do not do so.

[†] Jilung, about one month north of Lhasa.

There is said to be a direct route from Thok-Jalung, south-east to Tudam monastery, on the great Gartok and Lhasa road. This route crosses some comparatively low ranges, but is said generally to run over great plains. Such inhabitants as there may be on the north, east and south are all nomadic, living in standing camps, shifting every now and then according to the state of the pasture, time of the year, &c. They are almost all addicted to highway robbery.

I have already pointed out how well the Pundits have succeeded in the difficult art of intersecting and fixing distant peaks. The way in which the chief Pundit quartered his ground and divided it, so as to account for the geography of the whole, with a few routes, is another great improvement, their work covering a much greater breadth, and leaving very little doubt as to the position of the intermediate ranges. As before, the Chief Pundit showed great tact in making his way among strangers, and his conduct of the whole expedition is highly creditable, and the way in which he has carried out my instructions is deserving of all praise.

The 2nd Pundit proved useful in various ways. The 3rd Pundit, in his route-survey from Lujan-Chumik to Demchok, and thence to Totling, proved that he was thoroughly up to his work, and likely to prove a very valuable addition to the party.

It is a matter of regret that the Pundits were not able to fix the heights of the peaks they intersected, more especially of Aling-Gangri; but as they have now succeeded so well in fixing the positions, it only remains for them to learn to take altitudes to them, in order to determine their heights.

They have already been trained to do this, and I have no doubt but that their next expedition will prove fruitful in this respect.

ROUTE-SURVEY—BADRINATH TO TOTLING.

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
	° ′		
Badrinath	9 45	3,400	Latitude observations taken at Badrinath near Temple.
2 ..	338 0	1,200	
3 ..	313 0	700	
4 ..	3 30	3,300	
5 ..	351 30	6,100	
6 ..	330 0	4,000	
7 ..	344 0	10,000	
8 ..	315 30	12,700	
9 ..	24 30	11,700	Cross Himalayas by Chirbittia-la.
10 ..	22 45	11,800	
11 ..	67 0	11,700	
12 ..	358 0	4,700	Observations for latitude taken at Lumarti, 2760 paces from station 12 on route to station 13.
13 ..	28 0	6,000	
14 ..	6 30	6,800	Observations for latitude taken at station 14 (Chirkong).
15 ..	25 0	12,400	
16 ..	27 0	12,000	
17 ..	37 0	5,500	Observations for latitude taken at station 17 (Barku).
18 ..	76 45	10,000	
Totling 19 ..	..	..	Observations for latitude taken at Totling.

ROUTE-SURVEY—TOTLING TO THOK-JALUNG.

	° ′		
Totling	52 0	38,200	Observation for latitude taken at Nairding-Sumdo, 12,300 paces from Totling on route to station 20.
20 ..	68 0	50,600	Observations for latitude taken at Khangiah camp, 32,300 paces from station 20.
			Observations for latitude taken at Gugti camp, 50,340 paces from station 20.
21 ..	47 0	13,700	
22 ..	85 0	5,300	Observations for latitude taken at Dumlun-Sumdo, station 22.
23 ..	62 0	4,500	
24 ..	44 30	11,300	
25 ..	88 15	4,100	Observations for latitude taken at Chogo-Gugti, 2000 paces, and with a bearing of 250° from station 25.
26 ..	98 30	8,000	
27 ..	68 0	9,300	
28 ..	20 45	13,300	
29 ..	48 0	56,000	Observations for latitude taken at Giamchicho, 15,300 paces from station 29 on route to station 30.

ROUTE-SURVEY—TOTLING TO THOK-JALUNG—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
30 ..	20° 0′	3,700	Observations for latitude taken at Kiangmachumik, 35,500 paces from Giamchicho on route to station 30.
31 ..	44 30	30,600	
32 ..	70 0	19,900	Observations for latitude taken at Giachuruff, 5000 paces from station 31 on station 32.
33 ..	94 0	6,000	Observations for latitude taken at Thok-Jalung, 4000 paces from station 33 on route to end of bazar.
End of Thok-Jalung Bazar.			

ROUTE-SURVEY—GIACHURUFF TO GARTOK BY LUJAN CHUMIK AND GAR-GUNSA.

Giachuruff	316° 30′	22,700	
2 ..	300 0	19,100	Latitude observations taken at Shildung camp, station 2.
3 ..	290 0	4,100	
4 ..	246 0	5,700	Latitude observations taken at Giamchung-phu. 2000 paces from station 4 on route to station 5.
5 ..	291 0	9,400	
6 ..	323 0	4,400	
7 ..	289 0	17,100	Latitude observations taken at Thankar village. 8000 paces from station 7 on route to station 8.
8 ..	272 0	9,800	
9 ..	225 0	3,500	
10 ..	276 0	6,300	Latitude observations taken at Pika village, station 10.
11 ..	308 0	2,300	
2 ..	242 30	2,000	
13 ..	290 0	3,300	
14 ..	258 0	3,000	
15 ..	265 30	16,500	Latitude observations taken at Burkung, 900 paces from station 15 on route to station 16.
16 ..	258 0	11,100	
17 ..	287 0	10,000	Latitude observations taken at Marku camp, station 17.
18 ..	209 0	6,700	
19 ..	255 0	7,800	
20 ..	226 15	5,900	Latitude observations taken at Dak-Maru, or station 20.
21 ..	260 30	29,000	Latitude observations taken at Ralajung, 19,900 paces from station 21 on route to station 22.

ROUTE-SURVEY—GIACHURUFF TO GARTOK BY LUJAN-CHUMIK AND GARGUNSA—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
22 ..	227° 45′	9,500	
23 ..	143 0	19,500	Latitude observations taken at Lujan-Chumik, or station 23.
24 ..	130 0	24,800	Latitude observations taken at Ju camp, or station 24.
25 ..	150 0	47,200	Latitude observations taken at Gar-Gunsa, or station 25.
26 ..	129 0	26,700	Latitude observations taken at Loa-Gong camp, 30,400 paces from Gar-Gunsa on route to station 26.
Gartok	..	..	Latitude observations taken at Gartok.

ROUTE-SURVEY—LUJAN-CHUMIK TO DEMCHOK.

Lujan-Chumik ..	319° 15′	16,700	
2 ..	314 30	6,330	Latitude observations taken at Tashi-kang, or station 2.
3 ..	309 30	18,400	
4 ..	326 42	3,500	Latitude observations taken at Damakolok same as station 4.
5 ..	311 0	6,700	
6 ..	312 30	1,700	
Demchok	..	..	Latitude observations taken at Demchok.

ROUTE-SURVEY—DEMCHOK TO TOTLING.

Demchok	312° 30′	1,000	
7 ..	224 30	3,900	
8 ..	194 30	8,800	Latitude observations taken at Demchok-Phu, 5390 paces from station 8 on route to station 9.
9 ..	186 30	6,900	
10 ..	169 30	2,100	
11 ..	178 0	5,500	
12 ..	158 30	21,900	Latitude observations taken at Deboche, 4000 paces from station 12 on route to station 13.
13 ..	150 30	12,300	
14 ..	197 30	5,300	Latitude observations taken at Medokding village, station 14.
15 ..	117 0	7,200	
16 ..	160 30	8,800	Latitude observations taken at Dilchachini-Sumdo, 3500 paces from station 16 on route to station 17.

ROUTE SURVEY—DEMCHOK TO TOTLING—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
	° '		
17 ..	150 30	20,500	
18 ..	153 0	7,500	Latitude observations taken at bank of Lamoche stream, 6200 paces from station 18 on route to station 19.
19 ..	167 30	2,500	
20 ..	134 0	2,600	Latitude observations taken at Jia-Samdo, or station 20.
21 ..	206 0	12,300	
22 ..	223 0	4,100	Latitude observations taken at Chockche village, 800 paces from station 23 on route to station 24.
23 (same as station 1 below)	317 0	2,700	
24	308 0	5,600	Latitude observations taken at Rabgialing, 5600 paces from station 24.
1 (same as station 23 above	143 0	1,800	
2 ..	139 0	1,500	
3 ..	141 30	16,200	Latitude observations taken at Shangche village, 7600 paces from station 3 on route to station 4.
4 ..	142 0	3,600	
5 ..	160 0	4,100	
6 ..	114 30	4,000	
7 ..	131 0	10,200	Latitude observations taken at Tibuphu, 4900 paces from station 7 on route to station 8.
8 ..	102 0	4,000	
9 ..	69 30	1,700	
10 ..	104 0	4,100	
11 ..	187 30	4,800	Latitude observations taken at Dunkhar village, 600 paces from station 11 on route to station 12.
		24,300	
12 ..	181 0		
Totling	..	..	Latitude observations taken at Totling.

ROUTE-SURVEY—BARKU TO SHIPKI.

	° '		
Barku	229 0	10,400	
2 ..	224 30	9,500	
3 ..	244 0	9,500	
4 ..	287 0	2,000	
5 ..	305 0	1,700	
6 ..	290 30	1,700	
7 ..	234 0	2,700	
8 ..	284 30	2,000	
9 ..	340 0	3,300	Latitude observations taken at Puling-Gongma, or station 9.

ROUTE-SURVEY—BARKU TO SHIPKI—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
	° ′		
10 ..	294 30	3,000	
11 ..	289 0	7,900	
12 ..	292 0	2,500	
13 ..	325 0	4,500	
14 ..	305 0	2,900	
15 ..	323 0	1,900	
16 ..	323 0	13,200	
17 ..	345 0	3,300	
18 ..	322 0	4,500	Latitude observations taken at Rildighang, or station 18.
19 ..	325 0	2,200	
20 ..	301 0	3,300	
21 ..	298 0	9,500	
22 ..	308 0	7,200	Latitude observations taken at Ri village, or station 22.
23 ..	355 0	19,300	Latitude observations taken at Lanjan-Samba (bridge over Sutlej), 8500 paces from station 23 on route to station 24.
24 ..	324 30	4,600	
..	278 30	8,800	Latitude observations taken at Dongkhang, 3100 paces from station 25 on route to station 26.
26 ..	282 0	11,500	Latitude observations taken at Miang village, 2400 paces from station 26 on route to station 27.
27 ..	216 0	4,000	
28 ..	302 0	2,900	Latitude observations taken at Tiak village, 500 paces from station 28 on route to station 29.
29 ..	315 0	3,300	
30 ..	264 0	13,900	Latitude observations taken at Kuak village, 8550 paces from station 30 on route to Shipki.
Shipki	..	..	Latitude observations taken at Shipki.

ROUTE-SURVEY—SHIPKI TO NILUNG AND MUKPA.

	° ′		
Shipki	84 0	13,900	
2 ..	135 0	3,300	
3 ..	122 0	2,900	
4 ..	302 0	500	
5 ..	167 30	6,600	Latitude observations taken at Tiak village, or station 5.
6 ..	172 30	4,500	Latitude observations taken at Kuang, 2800 paces from station 6 on route to station 7.
7 ..	222 30	3,800	
8 ..	205 0	1,600	

ROUTE-SURVEY—SHIPKI TO NILUNG AND MUKPA—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
	° ′		
9 ..	170 30	12,300	Latitude observations taken at Sang, 4000 paces from station 9 on route to station 10.
10 ..	160 0	2,000	
11 ..	90 0	8,600	Latitude observations taken at Sumna, 5000 paces from station 11 on route to station 12.
12 ..	133 0	3,200	
13 ..	106 0	3,200	
14 ..	36 0	2,200	
15 ..	53 30	1,300	
16 ..	101 30	6,200	Latitude observations taken at Biar, 4700 paces from station 16 on route to station 17.
17 ..	157 30	2,700	
18 ..	126 30	4,500	
19 ..	129 0	2,800	Latitude observations taken at Sarang village, 800 paces from station 19 on route to station 20.
20 ..	152 45	3,700	
21 ..	139 0	1,700	
22 ..	127 30	2,000	
23 ..	130 0	2,300	
24 ..	141 0	1,300	
25 ..	205 0	2,300	
26 ..	156 0	10,000	
27 ..	177 0	6,900	
28 ..	167 0	10,700	
29 ..	202 30	1,900	
30 ..	193 30	3,000	
31 ..	235 0	1,900	
32 ..	188 0	1,900	Latitude observations taken at Chang-jum-Sumdo, 1280 paces from station 32 on route to station 33.
33 ..	231 0	1,100	
34 ..	176 0	1,000	
35 ..	203 0	2,200	
36 ..	196 0	1,200	
37 ..	153 0	4,300	
38 ..	212 30	1,800	
39 ..	160 0	1,200	
40 ..	192 0	4,400	Latitude observations taken at Nonam, 1600 paces from station 40 on route to station 41.
41 ..	196 30	3,800	
42 ..	158 0	1,400	
43 ..	211 0	2,800	
44 ..	251 30	2,700	
45 ..	263 30	4,300	
46 ..	217 0	1,100	
47 ..	255 30	5,600	Latitude observations taken at Nilung village, or station 47.
48 ..	182 0	2,500	

ROUTE-SURVEY—SHIPKI TO NILUNG AND MUKPA—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
	° '		
49 ..	213 0	5,700	
50 ..	220 0	3,700	
51 ..	259 0	5,300	
52 ..	225 0	2,000	
53 ..	257 0	2,000	
54 ..	288 0	5,700	
55 ..	266 0	4,900	
56 ..	259 0	3,200	
Mukpa	..	..	Latitude observations taken at Mukpa.

ROUTE-SURVEY—GARTOK TO DUNKHAR.

	° '		
Gartok	281 0	9,900	Latitude observations taken at Gartok.
2 ..	259 0	7,500	
3 ..	213 30	5,800	
4 ..	259 0	8,000	
5 ..	327 0	5,200	
6 ..	292 30	5,200	
7 ..	315 0	8,000	
8 ..	285 0	4,400	
9 ..	315 0	3,200	
10 ..	270 0	2,800	
11 ..	309 0	10,500	
12 ..	230 0	3,500	
13 ..	306 30	3,100	
14 ..	270 0	13,500	
15 ..	146 0	17,300	
16 ..	169 0	16,000	
17 ..	95 0	4,000	
Dunkhar	..	..	Latitude observations taken at Dunkhar.

ROUTE-SURVEY—DUNKHAR TO TOTLING.

	° '		
Dunkhar	185 1	5,200	
19 ..	179 0	23,700	
Totling	..	..	Latitude observations taken at Totling.

ROUTE-SURVEY—TOTLING TO CHIRKONG.

Name and Number of Station.	Bearings of Forward Station.		Distances in Paces to Forward Station.	REMARKS.
	°	'		
Totling	123	30	9,100	
2 ..	200	0	17,300	
3 ..	252	30	6,000	Latitude observations taken at Mang-nang village, or station 3.
4 ..	225	0	9,000	
5 ..	242	0	7,700	
6 ..	230	0	7,500	
Chirkong	..		..	Latitude observations taken at Chirkong.

ROUTE-SURVEY—GIACHURUFF TO JIACHAN UP THE RIVER INDUS.

	°	'		
Giachuruff	155	0	7,900	Latitude observations taken at Giachuruff.
2 ..	90	0	2,600	
3 ..	170	0	5,200	
4 ..	208	0	2,400	
5 ..	198	0	5,600	
6 ..	135	0	9,600	
7 ..	124	0	10,200	Latitude observations taken at Lapta-Rebo, station 7.
8 ..	193	0	10,000	Latitude observations taken at Nagpo-Shamdo, 7000 paces from station 8 on route to station 9.
9 ..	245	0	8,900	
10 ..	216	0	11,600	
11 ..	190	0	18,900	
Jiachan	..		..	Latitude observations taken at Jiachan.

ROUTE-SURVEY—MILAM TO GARTOK.

	°	'		
Milam	33	0	6,400	
2 ..	5	0	9,000	
3 ..	22	30	2,800	
4 ..	333	10	8,200	
5 ..	30	0	5,000	
6 ..	26	20	6,100	
7 ..	52	0	21,500	
8 ..	48	40	3,600	
9 ..	90	0	1,400	
10 ..	71	40	2,900	
11 ..	38	30	2,500	
12 ..	52	30	12,500	
13 ..	46	0	15,400	
14 ..	26	0	15,400	
15 ..	350	20	11,800	
16 ..	358	10	7,600	

ROUTE-SURVEY—MILAM TO GARTOK—*continued.*

Name and Number of Station.	Bearings of Forward Station.	Distances in Paces to Forward Station.	REMARKS.
17 ..	26° 0'	6,700	
18 ..	28 20	2,100	
19 ..	72 20	6,000	
20 ..	32 20	6,800	
21 ..	318 20	22,600	
22 ..	322 10	10,500	
23 ..	315 40	10,800	
24 ..	335 0	22,900	
25 ..	319 0	20,200	
Gartok	..	..	Latitude observations taken at Gartok.

ROUTE-SURVEY—GARTOK TO MILAM.

Gartok	170° 20'	10,300	Latitude observations taken at Gartok.
27 ..	141 20	8,800	
28 ..	155 30	4,200	Namochi, same as station 29.
29 ..	155 30	10,500	
30 ..	196 10	12,100	
31 ..	235 0	2,200	
32 ..	235 20	21,300	
33 ..	231 30	6,000	
34 ..	171 0	3,500	
35 ..	202 0	2,500	
36 ..	203 10	3,500	
37 ..	191 40	10,500	
38 ..	170 50	3,600	
39 ..	200 0	11,000	Dongpu village, same as station 40.
40 ..	196 0	3,000	Nagbo village, same as station 41.
41 ..	197 30	7,300	
42 ..	194 30	9,700	
43 ..	177 30	13,800	
44 ..	176 0	13,000	
45 ..	176 0	5,700	
46 ..	130 30	16,100	
47 ..	172 0	12,400	
48 ..	166 0	7,900	
5 ..	153 10	8,200	Nos. 5, 4, 3, 2, correspond with same numbers in route Milam to Gartok.
4 ..	202 30	2,800	
3 ..	185 0	9,000	
2 ..	213 0	6,400	
Milam	..	..	

OBSERVATIONS FOR LATITUDE TAKEN IN GREAT TIBET

No. of Observations.	Astronomical Date.	Watch Time.	STATION.	Object on Meridian.	Upper or Lowe Transit
	1867.	H. M.			
1	May 29..	6 30 P.M.	Badrinath Temple (near) ..	Polaris.	Lower
3	,, 31..	6 30 ,,	Ditto foot of steps	..	..
4	June 7..	11 30 ,,	Mana village, Ghonoli house ..	Antares.	Upper
5	,, 27..	10 0 ,,	Ditto	..	..
6	July 27..	3 30 ,,	Rában-Thok, camp Lumarti ..	Polaris.	..
7	,, 27..	4 30 ,,	Ditto Lumarti ..	..	..
8	,, 30..	3 15 ,,	Ditto ditto	(*Fomalhaut*)	..
11	Aug. 1..	4 15 ,,	Chirkong or Shibuk	Polaris.	..
13	,, 3..	4 15 ,,	East of Chaprang village at Thalthousa.	..	..
15	,, 5..	4 30 ,,	Totling village	..	..
16	,, 7..	11 0 ,,	Nairding-Sumdo camp	Altair.	..
17	,, 10..	2 30 A.M.	Khangiah	(*Fomalhaut*)	..
18	,, 11..	5 40 ,,	Dukti camp	Polaris.	..
19	,, 11..	5 40 ,,	Ditto	..	..
20	,, 11..	5 40 ,,	Dukte camp	..	..
21	,, 12..	..	Fort of Gugti-la..	..	..
22	,, 12..	..	Ditto	..	..
23	,, 13..	..	Gugti camp	..	..
24	,, 13..	..	Ditto	(*Fomalhaut*)	..
26	,, 16..	..	Nabipa-cho	Polaris.	..
27	,, 19..	4 0 ,,	Kiangmachumik	..	..
28	,, 20..	..	Giachuruff camp	..	..
29	,, 26..	2 42 ,,	Thok-Jalung, near gold mine	..	..
30	,, 27..	9 30 P.M.	Ditto	Altair.	..
33	,, 30..	9 5 ,,	Ditto	..	..
34	,, 30..	12 15 A.M.	Ditto	(*Fomalhaut*)	..
35	,, 30..	2 30 ,,	Thok-Jalung	Polaris.	..

with Elliott's 6-inch Radius Sextants, Nos. 44 and 45.

Double Altitude.	Single.	Index Error.	Deduced Latitudes.	Mean Latitudes.	Remarks.
° ′ ″			° ′ ″	° ′ ″	
58 40 0	..	+ 3′	30 44 29·4	..	Sextant No. 45.
58 41 10	..	..	30 45 4·7	..	Ditto.—See observation No. 84.
66 12 10	..	+ 3′ 10″	30 45 20·6	30 45 17·8	Ditto.
66 12 40	..	+ 2′ 50″	30 45 15·0	..	Ditto.
65 10 50	..	+ 2′ 30″	31 11 29·6	31 12 9·7	Ditto took observations for time 6h. 49m. 42s.
65 18 20	..	— 7′ 10″	31 10 24·6		Ditto No. 44.
57 4 0	..	..	31 13 22·3	..	Ditto.
65 23 10	..	— 7′ 10″	31 12 52·0	31 12 52·0	No. 44.
65 43 0	..	+ 2′ 30″	31 27 35·6	31 27 35·6	Ditto No. 45.
65 43 30	..	..	31 27 48·9	31 27 48·9	
134 5 30	..	— 7′ 10″	31 32 36·7	31 32 36·7	No. 44.
56 5 0	..	— 7′ 0″	31 42 52·7	31 42 52·7	Ditto near a ravine of the same name.
66 25 10	..	— 7′ 0″	31 44 0·3	31 44 47·0	Sextant No. 44.
66 17 0	..	+ 3′ 0″	31 44 55·3		Ditto No. 45.
66 16 0	..	+ 5′ 0″	31 45 25·3	..	Pocket Sextant No. 12.
66 23 30	..	+ 3′ 0″	31 48 18·7	31 47 33·7	Junction of two streams, Dunlung-Sumdo.
66 30 30	..	— 7′ 0″	31 46 48·7	..	Sextant No. 44.
66 39 20	..	..	31 51 13·1	31 54 17·5	Chojothal district.
55 25 30	..	+ 3′ 0″	31 57 21·9	..	Watch stopped.
67 0 40	..	— 7′ 0″	32 1 54·1	32 1 54·1	Ditto.
67 9 30	..	+ 3′ 0″	32 11 20·0	32 11 20·0	
67 16 0	..	..	32 14 34·5	32 14 34·5	District Singmiath, bank of Singi-Chu stream, also called Thok-Somba. Sextant No. 45.
67 37 0	..	..	32 25 5·6	32 24 26·5	
132 13 0	..	..	32 13 46·5		
132 13 10	..	..	32 23 41·8		
54 33 30	..	..	32 23 36·9		
67 37 20	..	..	32 25 16·8	..	Sextant No. 45.

OBSERVATIONS FOR LATITUDE TAKEN IN GREAT TIBET

No. of Observations.	Astronomical Date.	Watch Time.	STATION.	Object on Meridian.*	Upper or Low Transit
	1867.	H. M.			
36	Sept. 2..	12 5 noon.	Singmiath-Puttee	Sun.	Upper
37	,, 2..	11 40 P.M.	Ditto	Jupiter.	..
38	,, 2..	..	Ditto	Ditto.	..
40	,, 3..	12 18 A.M.	Ditto	(*Fomalhaut*)	..
41	,, 3..	1 0 ,,	Ditto	Polaris.	..
43	,, 4..	8 40 P.M.	Shildung camp	Altair.	..
44	,, 4..	2 0 A.M.	Ditto	Polaris.	..
45	,, 5..	2 0 ,,	Giamchung-phu camp	..	..
46	,, 6..	8 40 P.M.	Thanker (one house only) ..	Altair.	..
47	,, 6..	2 0 A.M.	Ditto	Polaris.	..
49	,, 7..	8 30 P.M.	Pika village	Altair.	..
50	,, 7..	11 30 ,,	Ditto	(*Fomalhaut*)	..
51	,, 7..	1 30 A.M.	Ditto	Polaris.	..
52	,, 8..	8 20 P.M.	Burkung village (in ruins) ..	Altair.	..
53	,, 8..	1 36 A.M.	Ditto	Polaris.	..
54	,, 9..	8 15 P.M.	Marku camp	Altair.	..
55	,, 10..	8 18 ,,	Dak-Maru	Altair.	..
56	,, 10..	11 48 ,,	Ditto	Polaris.	..
57	,, 11..	8 15 ,,	Ralajung	Altair.	..
58	,, 11..	1 30 A.M.	Ditto	Polaris.	..
59	,, 12..	8 15 P.M.	Lujan-Chumik camp	Altair.	..
60	,, 12..	1 25 A.M.	Ditto	Polaris.	..
61	,, 13..	8 0 P.M.	Name unknown	Altair.	..
62	,, 13..	1 30 A.M.	Ditto	Polaris.	..
63	,, 14..	7 55 P.M.	Gargunsa village	Altair.	..
64	,, 14..	1 25 A.M.	Ditto	Polaris.	..
65	,, 15..	7 50 P.M.	Loa-Gong camp	Altair.	..
66	,, 15..	1 40 A.M.	Ditto	Polaris.	..
67	,, 16..	1 30 ,,	Garyarsa, large village	..	..
68	,, 16..	7 30 P.M.	Ditto	Altair.	..
69	,, 18..	..	Ditto	..	..
70	,, 19..	1 0 A.M.	Ditto	Polaris.	..
71	,, 24..	7 15 P.M.	Dunkhar village	Altair.	..
73	,, 24..	5 0 A.M.	Ditto	Orionis. (*Rigel*)	..
74	,, 25..	Noon.	Ditto	Sun.	..

WITH ELLIOTT'S 6-INCH RADIUS SEXTANTS, NOS. 44 AND 45—*continued.*

Double Altitude.	Single.	Index Error.	Deduced Latitudes.	Mean Latitudes.	REMARKS.
132° 14′ 30″	..	+ 3′ 0″	32° 12′ 38″·4	Deduced thermometer 50°. Barometer 16·4 in.	One and a half mile south of Giachuruff Camp.
91 15 10	..	..	32 11 57·8		Ditto.
91 16 0	..	+ 5′ 0″	32 10 32·8	32° 9′ 23″·6	Pocket Sextant No. 12.
55 2 0	..	+ 3′ 0″	32 9 16·7	..	Wind was high; not confident in the observation.
67 2 0	..	..	32 7 40·8	..	Ditto.
132 27 10	..	..	32 16 42·9	32 19 27·0	Near Mane, not taken on Meridian.
67 31 10	..	..	32 22 11·0		
67 40 40	..	..	32 26 57·5	32 26 57·5	
132 0 40	..	..	32 29 57·6	32 30 47·6	
67 50 0	..	..	32 31 37·6		
131 58 0	..	..	32 31 18.2	32 31 43·1	
54 18 50	..	..	32 30 59·0		
67 51 20	..	..	32 32 17·5		
131 55 10	..	..	32 32 43·3	32 32 53·1	
67 52 50	..	..	32 33 2·8		
131 58 30	..	..	32 31 3·6	32 31 3·6	Near Singi-Chu stream.
132 0 30	..	+ 2′ 30″	32 30 18·8	32 30 3·0	(Near Gamuk village) on bank of Singi-Chu stream.
67 46 50	..	..	32 29 47·2		
132 5 0	..	..	32 28 4·4	32 27 52·6	On bank of Singi-Chu stream.
67 42 40	..	..	32 27 40·7		
132 11 40	..	..	32 24 44·5	32 24 35·1	
67 36 10	..	..	32 24 25·6		
132 30 50	..	— 7′ 0″	32 17 54·6	32 18 22·8	
67 30 30	..	..	32 18 50·9		
132 50 0	..	..	32 10 19·0	32 8 45·6	
67 11 10	..	..	32 7 12·1		
133 10 30	..	..	32 0 3·6	31 57 45·9	
66 47 40	..	..	31 55 28·1		
66 22 30	..	..	31 42 50·6	31 43 54·0	
133 40 30	..	..	31 45 4·2		
133 40 40	..	..	31 44 59·3		
66 22 10	..	..	31 42 41·6		
133 47 30	..	..	31 41 34·1	31 41 26·9	
100 3 0	..	..	31 41 7·7		
115 54 30	..	..	31 41 38·9		

OBSERVATIONS FOR LATITUDE TAKEN IN GREAT TIB

No. of Observations.	Astronomical Date.	Watch Time.	STATION.	Object on Meridian.	Upp or Lo Trans
	1867.	H. M.			
76	Sept. 28..	7 35 P.M.	Totling monastery	Altair.	Upp
77	,, 28..	10 45 ,,	Ditto	(*Fomalhaut*)	..
79	,, 29..	5 51 A.M.	Ditto	Orionis. (*Rigel*)	..
80	,, 30..	Noon.	Ditto	Sun.	..
81	Oct. 2..	5 40 A.M.	Ditto	Orionis. (*Rigel*)	..
82	,, 4..	7 0 P.M.	Mangnang village	Altair.	..
83	,, 4..	5 30 A.M.	Ditto	Orionis. (*Rigel*)	..
84	Nov. 14..	..	Badrinath Temple	Ditto.	..
1	Sept. 13..	..	Tashikang village	Altair.	..
2	,, 13..	..	Ditto	Polaris.	..
3	,, 14..	..	Domakolok camp	Altair.	..
4	,, 14..	..	Ditto	Polaris.	..
5	,, 15..	..	Demchok village	Altair.	..
6	,, 15..	..	Ditto	(*Fomalhaut*)	..
7	,, 15..	..	Ditto	Polaris.	..
8	,, 16	..	Demchok-phu camp	Altair.	..
9	,, 16..	..	Ditto	Polaris.	..
10	,, 17..	..	Deboche	(*Fomalhaut*)	..
11	,, 17..	..	Ditto	Polaris.	..
12	,, 18..	..	Madok Sing	Altair.	..
13	,, 18..	..	Ditto	Polaris.	..
14	,, 19..	..	Dilchachini-Sumdo	Altair.	..
15	,, 19..	..	Dilchachini-Sumdo	Polaris.	..
16	,, 20..	..	Right bank of Lamoche stream	Altair.	..
17	,, 20..	..	Ditto	(*Fomalhaut*)	..
18	,, 21..	..	Near Jia-Sumdo	Altair.	..
19	,, 22..	..	Rabgialing (near monastery) ..	..	..
20	,, 22..	..	Ditto	(*Fomalhaut*)	..
21	,, 22..	..	Ditto	Polaris.	..
22	,, 23..	..	Chokche village	Altair.	..
23	,, 23..	..	Ditto	(*Fomalhaut*)	..

WITH ELLIOTT'S 6-INCH RADIUS SEXTANTS, NOS. 44 AND 45—*continued.*

Double Altitude.	Single.	Index Error.	Deduced Latitudes.	Mean Latitudes.	REMARKS.
134° 9′ 40″	..	− 7′ 0″	31° 30′ 30″·3	31° 30′ 4″·7	Date mistaken.
56 31 0	..	..	31 29 56·2		
100 26 0	..	..	31 29 39·8		
112 23 10	..	..	31 30 22·5		
100 25 30	..	..	31 29 54·6		
134 27 0	..	..	31 21 50·1	31 21 47·2	
100 41 50	..	..	31 21 44·2		
01 56 50	..	..	30 44 9·9	..	Watch not going. See observations 1 and 3, preceding.
32 2 .0	..	+ 3′ 0″	32 29 19·4	.. 32 30 13·1	Observations taken near monastery.
67 49 0	..	..	32 31 6·7	..	Deduced thermometer 55°, barometer 18·2 inches.
131 46 0	..	..	32 37 18·6	32 38 9·7	Ditto.
68 4 40	..	..	32 39 0·8		
131 40 0	..	..	32 40 18·6	32 41 38·5	Thermometer 55°, barometer 18·2 inches.
53 58 0	..	..	32 41 22·9		
68 11 30	..	..	32 42 26·2		
131 45 20	..	..	32 37 38·1	32 38 30·7	Deduced thermometer 55°, barometer 17.5 inches.
68 5 20	..	..	32 39 23·3		
54 22 30	..	..	32 29 2·3	32 29 8·7	Thermometer 51°, barometer 16·8 inches.
67 45 0	..	..	32 29 15·1		
132 22 0	..	..	32 19 17·5	32 20 14·0	Ditto.
67 28 50	..	..	32 21 10·5		
132 36 30	..	..	32 12 3·1	32 13 3·7	Junction of two streams (Sumdo), thermometer 52°, barometer 17·2 inches.
67 14 40	..	..	32 14 4·3	32 13 3·7	Ditto.
132 58 30	..	..	32 1 2·9	32 0 47·8	Thermometer 53°, barometer 17·4 inches.
55 19 30	..	..	32 0 32·6		
133 1 10	..	..	31 59 43·0	31 59 43·0	Ditto.
133 10 20	..	..	31 55 8·0	31 53 37·0	Thermometer 53°, barometer 17·5 inches.
55 30 30	..	..	31 55 2·4		
66 30 50	..	..	31 52 8·8		
133 14 40	..	..	31 52 58·2	31 52 58·2	Thermometer 54°, barometer 17·8 inches.
55 34 40	..	..	31 52 58·1		

OBSERVATIONS FOR LATITUDE TAKEN IN GREAT Ti

No. of Observations.	Astronomical Date.	Watch Time.	STATION.	Object on Meridian.	Upp or Low Tran
	1867.	H. M.			
24	Sept. 24..	5 30 A.M.	Shangche village (near)	Altair.	Upp
25	,, 24..	..	Ditto	(*Fomalhaut*)	..
26	,, 25..	..	Tibu phu	Altair.	..
27	,, 25..	..	Ditto	(*Fomalhaut*)	..
28	,, 25..	..	Ditto	Polaris.	..
29	,, 26..	..	Dunkhar village	Altair.	..
30	,, 26..	..	Ditto	(*Fomalhaut*)	..
31	,, 26..	..	Ditto	Polaris.	..
1	,, 30..	7 25 P.M.	Barku village	Altair.	..
2	,, 30..	10 30 ,,	Ditto	(*Fomalhaut*)	..
3	,, 30..	5 0 A.M.	Ditto	Orionis. (*Rigel*)	..
4	Oct. 2..	7 30 P.M.	Puling-gongma	Altair.	..
5	,, 2..	10 16 ,,	Ditto	(*Fomalhaut*)	..
6	,, 2..	4 30 A.M.	Ditto	Orionis. (*Rigel*)	..
7	,, 4..	7 30 P.M.	Rildighang village	Altair.	..
8	,, 4..	10 10 ,,	Ditto	(*Fomalhaut*)	..
10	,, 4..	4 40 A.M.	Ditto	Orionis. (*Rigel*)	..
11	,, 4..	5 40 ,,	Ditto	(*Sirius*)	..
12	,, 5..	7 30 P.M.	Ri village	Altair.	..
13	,, 5..	10 55 ,,	Ditto	(*Fomalhaut*)	..
14	,, 5..	4 56 A.M.	Ditto	α Orionis.	..
15	,, 5..	5 42 ,,	Ditto	(*Sirius*)	..
17	,, 6..	12 15 ,,	Ditto	Polaris.	..
18	,, 7..	7 20 P.M.	Lanjan Samba	Altair.	..
19	,, 7..	5 33 A.M.	Ditto	(*Sirius*)	..
20	,, 8..	9 42 P.M.	Dongkhang	(*Fomalhaut*)	..
21	,, 8..	5 30 A.M.	Ditto	(*Sirius*)	..
22	,, 9..	12 o'clock.	Miang village	Polaris.	..
23	,, 9..	3 53 A.M.	Ditto	Orionis. (*Rigel*)	..
24	,, 9..	5 21 ,,	Ditto	(*Sirius*)	..
25	,, 10..	9 30 P.M.	Tiak village	(*Fomalhaut*)	..
26	,, 10..	5 15 A.M.	Ditto	(*Sirius*)	..

Elliott's 6-inch Radius Sextants, Nos. 44 and 45—*continued*.

Altitude.	Single.	Index Error.	Deduced Latitudes.	Mean Latitudes.	Remarks.
21′ 40″	..	+ 3′ 0″	31° 49′ 28″·3	31° 49′ 16″·0	Thermometer 54°, barometer 18·0 inches.
42 30	..	..	31 49 3·6		
36 0	..	..	31 42 18·4		
58 0	..	..	31 41 18·7	31 42 0·7	Thermometer 55°, barometer 18·2 inches.
11 0	..	..	31 42 12·8		
42 20	..	..	31 39 9·1	..	600 paces s.w. of village.
0 10	..	..	31 40 16·8	31 39 34·1	
5 30	..	..	31 39 25·2		
10 0	..	+ 2′ 0″	31 25 50·4		
30 0	..	..	31 25 55·9	31 25 52·0	
24 40	..	..	31 25 49·7		
20 50	..	..	31 20 24·7		
41 0	..	..	31 20 22·7	31 20 20·2	Camp.
35 50	..	..	31 20 13·3		
0 0	..	..	31 30 50·3		
17 0	..	..	31 32 25·0	31 31 9·9	
13 40	..	..	31 31 19·5		
55 0	..	..	31 30 4·7		
48 10	..	..	31 36 45·1		
8 20	..	..	31 36 43·9		
30 0	..	..	31 37 0·7	31 36 58·5	
42 0	..	..	31 36 34·1		
2 0	..	..	31 37 11·0		
39 30	..	..	31 41 7·0	31 41 8·0	Near bridge over Sutlej River.
33 0	..	..	31 41 9·0		
51 0	..	..	31 45 24·6	31 45 49·7	
22 40	..	..	31 46 14·7		
23 0	..	..	31 47 38·0	..	(Midnight.)
42 0	..	..	31 47 11·5	31 47 16·3	
22 0	..	..	31 46 37·7		
48 10	..	..	31 46 58·8	31 46 59·5	
21 20	..	..	31 47 0·2		

OBSERVATIONS FOR LATITUDE TAKEN IN GREAT T

No. of Observations.	Astronomical Date.	Watch Time.	STATION.	Object on Meridian.
	1867.	H. M.		
27	Oct. 11..	6 20 P.M.	Shipki village	Altair.
28	,, 11..	9 23 ,,	Ditto	(*Fomalhaut*)
29	,, 11..	3 40 A.M.	Ditto	Orionis. (*Rigel*)
30	,, 11..	5 10 ,,	Ditto	(*Sirius*)
31	,, 12..	6 12 P.M.	Kuak village	Altair.
32	,, 12..	11 48 ,,	Ditto	Polaris.
33	,, 14..	9 6 ,,	Kuang village	(*Fomalhaut*)
34	,, 14..	3 22 A.M.	Ditto	Orionis. (*Rigel*)
37	,, 16..	8 55 P.M.	Sumna village	(*Fomalhaut*)
38	,, 17..	8 50 P.M.	Beghar or Bikar village	..
39	,, 18..	8 45 ,,	Sarang village	..
40	,, 18..	10 55 ,,	Ditto	Polaris.
41	,, 18..	3 4 A.M.	Ditto	Orionis. (*Rigel*)
42	,, 18..	3 32 ,,	Ditto	(*Sirius*)
43	,, 20..	11 30 ,,	Ditto	Sun.
44	,, 23..	8 20 P.M.	Changjum Sumdo	(*Fomalhaut*)
45	,, 24..	8 15 ,,	Nonam	..
46	,, 25..	8 10 ,,	Chongsa or Nilung village ..	..
47	,, 26..	Noon.	Ditto	Sun.
48	,, 26..	8 5 P.M.	Ditto	(*Fomalhaut*)
49	,, 29..	7 50 ,,	Ditto	..
50	,, 29..	..	Ditto	Orionis. (*Rigel*)
51	,, 29..	..	Ditto	(*Sirius*)
52	,, 29..	..	Ditto	(*Procyon*)
53	,, 30..	Noon.	Ditto	Sun.
55	Nov. 6..	..	Mukpa village	..
56	,, 6..	7 55 P.M.	Ditto	(*Fomalhaut*)
57	,, 7..	Noon.	Ditto	Sun.
58	,, 8..	7 55 P.M.	Ditto	(*Fomalhaut*)
59	,, 8..	..	Ditto	(*Sirius*)
61	,, 9..	Noon.	Ditto	Sun.
1	Aug. 26..	..	Lapta Rebo camp	Polaris.
2	,, 29..	..	Jiachin camp	(*Fomalhaut*)
3	,, 30..	..	Nagpo Shando camp	Polaris.

TH ELLIOTT'S 6-INCH RADIUS SEXTANTS, NOS. 44 AND 45—*continued.*

ble Altitude.	Single.	Index Error.	Deduced Latitudes.	Mean Latitudes.	REMARKS.
′ ″ 24 50	..	+ 2′ 0″	° ′ ″ 31 48 27·5	° ′ ″ 31 48 25·6	
44 50	..	..	31 48 37·4		
39 40	..	..	31 48 22·8		
18 50	..	..	31 48 14·5		
27 20	..	..	31 47 12·3	31 47 49·6	
24 40	..	..	31 48 26·8		
53 50	..	..	31 44 0·5	31 43 52·6	
48 50	..	..	31 43 44·7		
8 20	..	..	31 36 43·2	31 36 43·2	
6 50	..	..	31 37 32·1	31 37 32·1	
13 40	..	..	31 34 5·3	31 34 11·3	
56 0	..	..	31 34 12·6		
8 30	..	..	31 33 54·6		
46 50	..	..	31 34 10·3		
58 40	..	..	31 34 29·8	..	On meridian.
47 10	..	..	31 17 18·6	31 17 18·6	
0 40	..	..	31 10 33·4	31 10 33·4	
7 30	..	..	31 7 10·3	31 6 17·9	
41 40	..	..	31 6 16·5		
9 50	..	..	31 6 0·2		
10 0	..	..	31 5 54·8		
4 30	..	..	31 5 54·0		Watch ceased going.
43 0	..	..	31 6 4·5	..	Ditto.
55 50	..	..	31 5 4·6	..	Ditto.
56 40	..	..	31 7 58·2		
42 20	..	..	31 2 25·6		
18 30	..	..	31 1 44·3	31 2 10·8	
5 40	..	..	31 2 47·2		
18 20	..	..	31 1 49·1		
51 20	..	..	31 1 56.4		
56 20	..	..	31 2 21·9	31 2 10·8	
58 10	..	− 7′ 0″	32 0 23·0	32 0 23·0	
20 30	..	..	32 5 27·3	32 5 27·3	A little after transit.
44 0	..	..	31 53 19·2	31 53 19·2	

OBSERVATIONS OF THE BOILING

No. of Station.	Astronomical Date.	Watch Time.	STATION.
	1867.	H. M.	
1	June 28	5 42 P.M.	Badrinath
2	July 4	8 30 A.M.	Mana village, 1¼ mile N. of Badrinath
3	,, 5	4 30 P.M.	Ditto
4	,, 26	7 0 A.M.	Ghastoli (halting-place)
5	,, ,,	7 0 ,,	Ditto
6	,, 27	3 0 P.M.	Tare (foot of hill)
7	,, 28	9 0 A.M.	Hutoli (pile of stones)
8	,, 30	Noon.	Lumarti-Sundo camp
9	,, ,,	..	Ditto
10	Aug. 1	5 47 A.M.	Ditto
11	,, 2	7 40 ,,	Chirkong
12	,, 4	6 8 ,,	Barku village
13	,, 5	4 0 P.M.	Totling monastery
14	,, 7	7 0 ,,	Be-Songbo-ka-Sumdo
15	,, 8	6 8 ,,	(Larcha) Bogola foot of mountain
16	,, 9	9 0 A.M.	Bogola
17	,, ,,	6 30 P.M.	On the other side of Bogola
18	,, 10	6 30 ,,	Khangiah camp
19	,, 11	5 10 ,,	Gugti camp
20	,, 12	4 25 ,,	Gugti-Sumdo
21	,, 13	9 0 A.M.	Gugti-la
22	,, ,,	5 45 P.M.	(Chojothol) Gugti camp
23	,, 14	5 5 ,,	Lojan camp
24	,, 15	6 0 ,,	Chojo-Gunsa
25	,, 16	6 36 ,,	Name not known
26	,, 19	4 23 ,,	Kiangma Chumik
27	,, 20	9 0 A.M.	Paba-la
28	,, ,,	5 30 P.M.	(In Puttie Singmiath) Giachuruff
29	,, 22	3 53 ,,	Chomorang-la

POINT TAKEN IN GREAT TIBET.

THERMOMETER.		THERMOMETER.		Deduced height above Sea.	REMARKS.
No.	Boiling Point.	No.	In Air.		
22	195·40	30	60·00	10,284	On first step of temple.
,,	195·10	,,	64·00	10,510	
,,	195·00	,,	66·00		
,,	190·40	38	51·00	13,251	
30	191·00	,,	50·00		
,,	185·50	,,	50·00	16,587	
,,	182·00	,,	37·00	18,576	On crest of pass, also called Chirbitiala and Doongri-la.
,,	185·50	,,	57·50	16,660	
22	185·40	,,	57·50	16,317	
30	185·50	,,	30·00	16,396	
,,	187·00	,,	53·50	15,708	
,,	191·50	,,	55·50	13,005	
,,	192·75	,,	69·00	12,295	On house-top about 15 feet above ground, and 60 feet above river.
,,	191·50	,,	64·00	13,050	Junction of streams.
,,	187·50	,,	49·00	15,364	
,,	181·00	,,	40·00	19,220	On crest of pass.
,,	186·50	,,	45·50	15,935	Foot of mountain.
,,	188·00	,,	58·25	15,129	
,,	188·00	,,	67·50	15,205	On bank of Gugti stream.
,,	184·50	,,	62·50	17,324	Junction of streams.
,,	180·50	,,	37·00	19,490	On crest of pass.
,,	185·00	,,	58·25	16,968	On the other side of Gugti-la.
,,	186·00	,,	58·25	16,353	On bank of Lang-Chu stream.
,,	187·00	,,	53·00	15,700	Ditto.
[illegible]	187·75	[illegible]	58·25	15,289	
[illegible]	[illegible]	[illegible]	·00	16,669	Halting-place where water is procurable
[illegible]	[illegible]	[illegible]	[illegible]	17,649	On crest of pass.
[illegible]	[illegible]	[illegible]	[illegible]	15,732	Camp on bank of Singi-Chu stream.
[illegible]	[illegible]	[illegible]	[illegible]	16,949	Foot of mountain.

OBSERVATIONS OF THE BOILING

No. of Station.	Astronomical Date.	Watch Time.	STATION.
	1867.	H. M.	
30	Aug 23	6 0 P.M.	Chomorang camp
31	,, 27	7 0 A.M.	Thok-Jalung (near gold-mine)
32	,, 29	2 50 P.M.	Ditto
33	,, 31	3 0 ,,	Chomorang-la
34	Sept. 4	6 15 ,,	Shildung camp
35	,, 5	4 23 ,,	Giamchung (Gopha)
36	,, 6	5 30 ,,	Thanker village
37	,, 7	5 52 ,,	Pika village
38	,, 8	6 30 A.M.	Ditto
39	,, ,,	3 36 P.M.	Burkung village (in ruins)
40	,, 9	4 15 P.M.	Marku camp
41	,, 10	5 12 ,,	Dak Maru (red hill)
42	,, 11	6 2 A.M.	Ditto
43	,, ,,	5 35 P.M.	Ralajung (on bank of Singi-chu)
44	,, 12	5 55 ,,	Lujan-Chumik
45	,, 13	5 0 ,,	On bank of Garjung-Chu stream
46	,, 14	5 30 ,,	Gargunsa village, near stream
47	,, 15	5 30 ,,	Loagong (Rebo) camp
48	,, 17	5 30 A.M.	Garyarsa monastery
49	,, 25	9 0 ,,	Dunkhar village
50	,, 30	6 55 ,,	Totling (monastery)
51	Oct. 5	8 0 ,,	Mangnang village
1	Aug. 25	5 30 P.M.	Gobarteja-rebo
2	,, 28	6 30 A.M.	Chakrang camp
3	,, 29	7 0 ,,	Niarcher camp
4	,, ,,	5 30 P.M.	Giachan Gûnsa (house)
5	Sept. 23	6 30 A.M.	Tashikong village
1	Oct. 1	6 30 ,,	Barku village
2	,, 2	6 12 ,,	Sharbarak-chu
3	,, 3	6 6 ,,	Puling-Gongma camp
4	,, 5	5 50 ,,	Rildighang camp
5	,, 6	5 15 ,,	Ri village
6	,, 8	5 59 ,,	Lanjam-Samba (near)
7	,, ,,	4 38 P.M.	Sirang-la

POINT TAKEN IN GREAT TIBET—*continued.*

THERMOMETER.		THERMOMETER.		Deduced height above Sea.	REMARKS.
No.	Boiling Point.	No.	In Air.		
30	184·50	30	45·00	17,151	
,,	185·75	,,	41·00	16,346	16,337
,,	186·00	,,	55·00	16,327	
,,	182·00	,,	53·00	18,765	On top of mountain.
,,	188·75	38	55·00	14,652	Near stream.
,,	188·50	,,	62·50	14,861	
,,	188·75	,,	59·75	14,688	On bank of Singi-Chu, about 12 feet over the water.
,,	188·80	,,	56·75	14,637	
,,	189·00	,,	40·00	14,388	
,,	189·40	,,	64·00	14,324	On bank of Singi-Chu stream.
,,	189·75	,,	57·50	14,071	Ditto.
,,	190·00	,,	58·25	13,920	On top of hill.
,,	190·50	,,	23·00	13,393	
,,	191·50	,,	58·50	13,022	
,,	191·50	,,	54·50	12,999	On bank of Garjung-Chu stream.
,,	191·00	,,	53·00	13,287	
,,	189·50	,,	47·00	14,147	
38	188·75	,,	49·00	14,381	
,,	188·75	,,	30·00	14,241	
,,	190·00	,,	51·50	13,652	
,,	192·50	,,	42·00	12,101	
22	190·80	,,	Supposed 30	12,867	
38	187·00	,,	56·00	15,495	In puttee Singmiath.
,,	186·50	,,	40·00	15,659	
,,	186·50	,,	44·30	15,709	
,,	186·25	,,	47·25	15,878	
30	191·50	,,	60·25	13,027	Near Monastery.
38	191·75	,,	34·00	12,503	
,,	190·00	,,	36·25	13,545	
,,	189·50	,,	29·50	13,801	
,,	189·50	,,	17·00	13,709	
,,	189·75	,,	26·50	13,634	
,,	196·00	,,	39·75	10,039	On bank of Sutlej River.
,,	185·00	,,	32·00	16,491	On top of mountain.

OBSERVATIONS OF THE BOILING

No. of Station.	Astronomical Date.	Watch Time.	STATION.
	1867.	H. M.	
8	Oct. 9	6 0 A.M.	Dongkhang (one house)
9	,, 10	5 51 ,,	Miang village
10	,, 11	6 37 P.M.	Tiak village
11	,, 12	6 25 A.M.	Shipki village
12	,, 13	5 28 ,,	Kuak village
13	,, 15	7 32 ,,	Kuang village
14	,, ,,	12 24 P.M.	Pungrang-che-la
15	,, 16	7 7 A.M.	Sang village
16	,, ,,	12 42 P.M.	Pimikche-la
17	,, 17	7 35 A.M.	Sûmna (junction of streams)
18	,, 18	7 6 ,,	Bikar village
19	,, 19	8 55 ,,	Saráng village
20	,, 22	12 55 P.M.	Tago-la
21	,, 24	7 32 A.M.	Sumdo Changjum camp
22	,, 25	7 22 ,,	Nonam village
23	,, 27	6 30 P.M.	Nilung or Chorsa village
24	,, 30	1 8 ,,	Ditto
25	Nov. 7	4 45 ,,	Mukpa village
26	,, 11	6 42 A.M.	Ditto

Point taken in Great Tibet—*continued.*

Thermometer.		Thermometer.		Deduced height above Sea.	Remarks.
No.	Boiling Point.	No.	In Air.		
38	189·50	38	..	..	The Mercury sunk so low that the thermometer could not be read.
,,	193·50	,,	30·00	11,458	
,,	196·75	,,	36·50	9,592	
,,	196·00	,,	35·00	10,027	On top of a house.
,,	196·00	,,	37·50	10,030	
,,	191·50	,,	27·00	12,610	
,,	185·75	,,	34·00	16,057	On crest of pass.
,,	189·50	,,	18·00	13,715	
,,	183·50	,,	33·00	17,403	Ditto.
,,	190·50	,,	28·00	13,201	
,,	194·00	,,	38·00	11,201	
,,	193·00	,,	37·50	11,783	
,,	184·50	,,	34·00	16,810	On crest of pass
,,	190·75	,,	16·00	12,984	
,,	191·50	,,	22·00	12,583	
,,	194·00	,,	32·00	11,181	
,,	193·75	,,	51·00	11,407	
,,	199·25	,,	48·00	8,172	Alongside Dharamsala.
,,	199·50	,,	34·00	8,012	

X.—*Narrative of a Journey through the Afar Country.* By W. MUNZINGER, Esq., Hon. Corresponding Member R.G.S.

Read, April 26, 1869.

I. DEPARTURE, AND ARRIVAL AT AMPHILLA.

As, ever since my arrival in Africa, I have occupied myself constantly in completing the geography of its Eastern coast, it was with the greatest pleasure I accepted Colonel Merewether's invitation to travel over and study the route which conducts from Amphilla towards the Abyssinian plateau. On the 9th June, 1867, at 4·30 A.M., we embarked on board the *Dalhousie*. I had with me eight men; Simon, a Swiss in my service, an old soldier of the Foreign Legion in Algería; Syud Ibrahim, formerly a corporal in the Turkish Service, and a fine man of striking aspect; Mahomed Hindi, an Indian, formerly harbourmaster of Massowa; four servants from my own house; and lastly, though not the least important, the very small and very black Abdulla Bellal, our guide, or rather dragoman. A few words on the latter. I made his acquaintance three months before, when I was seeking information about the Dankali country. My clerk brought him to me as being a man who had made the journey to the Asubo Galla, in the suite of Osman, Chief of the Dumhoita. The man pleased me by his vivacity. He gave me a description of the route from Amphilla into Abyssinia, which was not very exact, in consequence of his ignorance of geography; but all that he told me of the country was true, and his advice very good. Thus he advised me to procure mules from Massowa; I then had four good animals, but our departure being delayed there remained but one baggage mule, which was embarked with my other animals; the others were either dead or ill; to have bought more then would have been of no use, there being no good animal to be had. These circumstances caused us during the journey great annoyance and fatigue. I left Massowa without having communicated my plans to any one; I thought that the Governor there would have given few facilities to the first part of my journey; being mistrustful and jealous, he would have suspected something in my going, have thrown difficulties in my way, or, worse still, would have sent soldiers with me. No one can judge too severely of this mistrust. The steps which different agents have taken to establish posts in these parts are too recent to be forgotten. I think, therefore, I did well, although the great difficulty which lies in entering the country was thereby thrown upon me alone.

I took as few things as possible, some flour, biscuits, rice,

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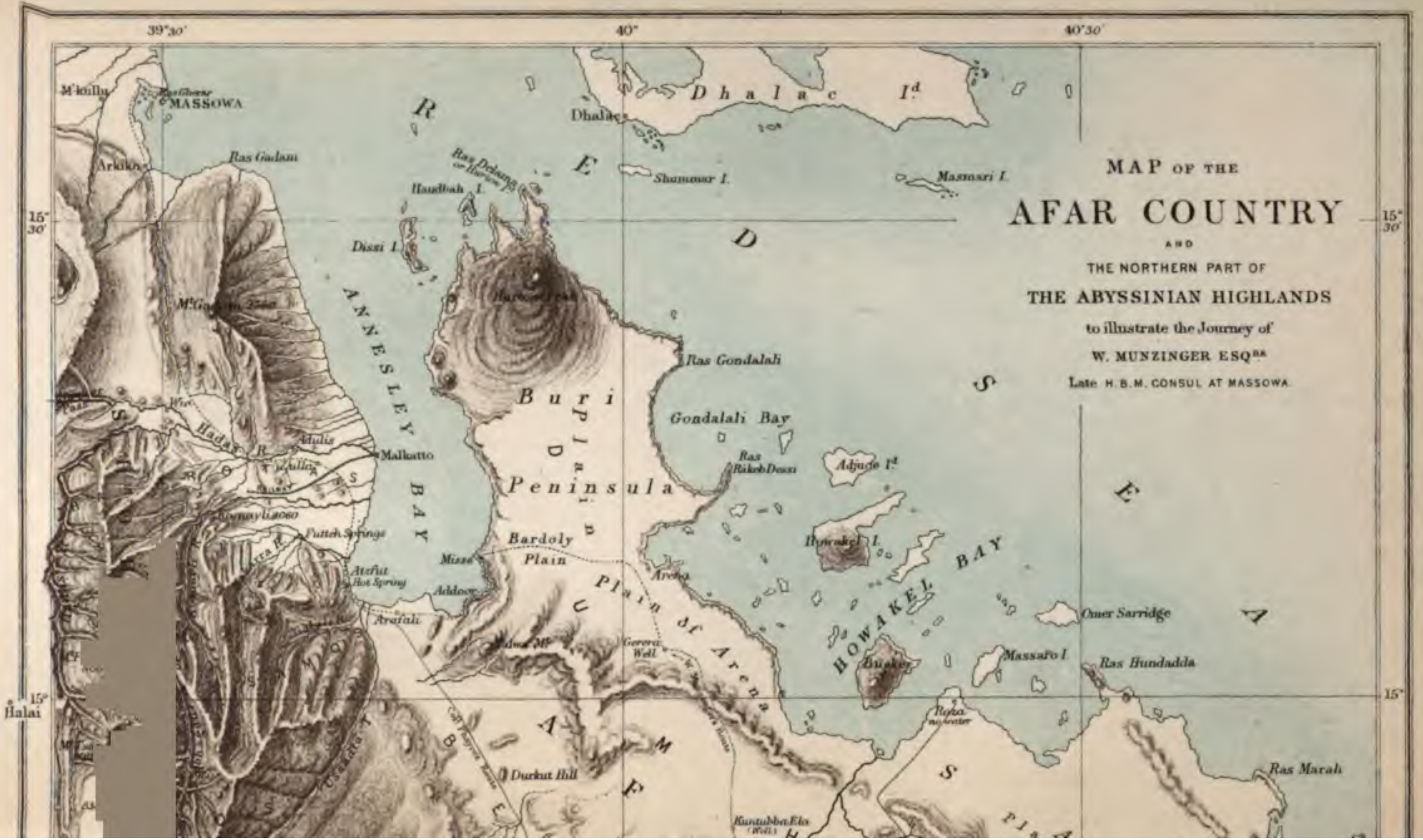

MAP OF THE
AFAR COUNTRY
AND
THE NORTHERN PART OF
THE ABYSSINIAN HIGHLANDS
to illustrate the Journey of
W. MUNZINGER ESQ^RE
Late H.B.M. CONSUL AT MASSOWA

coffee, a few bottles of brandy, and the most necessary medicines. I received on loan from the Aden Residency six muskets and ammunition, and a revolver; every man therefore was armed. Two of my servants learned to shoot *en route*, and as I only allowed them to fire in lonely places, they had the character of being first-rate shots. My instruments were two watches, a thermometer, a good compass, a very good Pastorelli's aneroid barometer, given me by Colonel Merewether, and a hypsometer, which did not go far, as will be seen in the sequel. I enter into all these particulars, as they will prove interesting to travellers.

The anchor being raised we started at 5·30 A.M., and I passed a most agreeable day with my host, Captain O'Brien Carew, and Mr. Dawes, who did their best to make me think of the amenities of life in civilized Europe.

Contrary winds prevented us from arriving until after nightfall at the port of Amphilla. I at once sent the dragoman, Abdulla, to announce my arrival to the chief of the village, with a request that he would procure me two camels to take me to him.

On the morning of the 10th June I bade adieu to my amiable host. Mr. Dawes landed with me. We disembarked at the end of the bay, at the side of a cluster of rocks, where the boats could touch the shore; there we found the Amphilla people awaiting us with the dragoman. I talked to them a little, and explained briefly my project. Mr. Dawes recommended me to the chiefs as a traveller; we shook hands, and bade adieu to European life for some time. At 8 A.M. I found myself alone, and I could not conceal that, notwithstanding the years I have passed amongst natives, I always feel anew the pang of separating from my European friends. The *Dalhousie* did not leave till noon, when I saw her towards the south travelling at full speed. Good-bye to her!

II. STAY at AMPHILLA.

The place where we disembarked was an arid coast, without trees or shrubs; we therefore profited, with thankfulness, by the shade afforded by the overhanging rocks. We were obliged to pass the day here, as they had no camels ready for us. A little way to the south were some wells. We saw plenty of sheep. The water was sweet, but in the summer, we were told, it became very salt. Towards the evening they brought us two camels—fine animals—which had probably never been mounted, they were so untractable. To our great astonishment there were no saddles. In their place we made cushions of skins and sails, which after a while succeeded, and by following the coast we arrived at the village of Amphilla.

Amphilla has only about 20 houses. One-half are square wooden houses, like those at Massowa; the rest are tents, covered with matting. The village is built on an elevation 50 feet above the level of the sea. A Turkish flag-staff was planted in front of the Chief's house. The sea-shore is fringed with a forest of mangroves; the ground round the village is covered with herbs. The inhabitants of Amphilla are Hadaremas; they are not therefore quite at home. The tribe of Dumhoita have the upper hand as far as Ayth; the Chief of the village, Beddaha, holds the chiefdom in his mother's right, which makes him tolerated by the former. She was the celebrated Alia, daughter of the Dumhoita Chief Nakoda. She is the so-called Princess of Amphilla. It appears that when young she was very beautiful, and when her beauty faded it was replaced by her virtues, great wisdom and a generous hospitality. It is for this reason that in the eyes of travellers she was always the Princess of the country; her fame reached to Massowa. Ibrahim Pasha, an old fool, who dreamed eternally of conquests, invited her to visit him. I was at Massowa in 1854 when she arrived; they paid her great honours, and she returned in a Turkish gunboat, with instructions to guard the port of Amphilla against the infidels. The Pasha naturally reported her coming to Constantinople, from which place they sent her rich presents. She has been dead now two years. Her son is sixty-five years of age, but he carries his age well. Her daughter Hindia is married to a man named Abdulla, Under-Chief, who is eighty years old. A large goître he had on the nape of his neck astonished us; it was a perfect example of cretinism in this country.

Both Chiefs are very quiet and polite. They remember Mr. Salt quite well. Abdulla tells me that he was then a grown man. We slept in the open air; it was nice and cool, and a heavy dew falling. As I soon found that the people of Amphilla had no influence in the interior, and that even in their own village they depended a great deal on the Dumhoitas, I sent my dragoman to Fridello to the Chief Ali, one of the principal Chiefs of the Dumhoitas, to tell him I wished to consult with him. I begged him to send me some beasts of burden. I learned that illness prevented his paying me the first visit. Abdulla started during the night. I lent him one of my mules, as he said he was afraid of snakes. I did not believe him in this excuse, but lent him the mule, as I did not wish to disgust the man on first starting out. I found out afterwards the snakes were not imaginary ones. On the 11th June Beddaha brought me a goat, which was the limit of his hospitality. During the morning Abdulla returned with a young man, a native of Zulla, called Mahomed, son of Ali, son-in-law of Ali the Chief. He had only been married to the daughter of the latter two months, but I think he will soon get accustomed to his new country. The young man appeared discreet, and translated in the Tigré language with astonishing facility. He brought two messages; one for me, one for Beddaha. The Chief, Ali, told me I was most welcome, and that he sent me two asses to go to him, when I could explain what I wanted. The message addressed to the Chief of Amphilla was very different, and requires explanation.

A short while before my arrival the *Victoria* anchored at Amphilla; the village chief went on board, where he found Colonel Merewether, who made him a present to encourage him in his hospitality. Beddaha, to avoid being obliged to give up a portion of the present, concealed the fact of his having received it; but in this country, where nothing can remain a secret, a report was spread that the Chief of Amphilla had received a certain sum to show the country to strangers. Naturally, on my arrival, I was supposed to have done the same. The Chief, Ali, was angry that Beddaha, himself almost a subject, should receive money for protecting travellers, and in his first anger he proposed killing my two mules, to show how powerless my host was, when, just in time, my dragoman arrived, who quieted him; but he ordered the Chief of Amphilla to be told: "You have received money to conduct strangers into the interior; now if you can fulfil your engagement, do so." Beddaha declared he had received nothing. Notwithstanding my saying I knew nothing of the transaction, the messenger invited him to take an oath as to his innocence; and when Beddaha would not swear, he gave, to finish the discussion, two dollars for Ali, and declared it rested with the Dumhoita to give me a passport. It was settled, therefore, that I should go to Fridello that evening. The same morning three men came from Mader, drawn here by the news of my arrival. The people of this village are Afar, like the others, but they rejoice in a certain civilisation, which has the effect of making them more cunning. They have boats, in which they go to Arabia and Massowa, they dress in coloured silks, and they monopolise commerce with the interior; it is not therefore astonishing that they do all in their power to close the country against strangers. Before coming to see me, they went to the Chief, and said, "You are acting very unwisely in allowing a Frandji (an European) to enter. Ask the Consul first if he has a letter of recommendation from the Pasha of Massowa; if he has not, and you allow him to pass, without doubt you will be severely punished." These menaces, of course, had their effect. Beddaha came and told me, and appeared inclined to prevent my progress. I treated his fears with ridicule. As Consul I told him I had a right to go where I chose; he could refuse me a passport, but no one could stop me, because I was inviolable. "Further," I said, "my journey can do you no harm. I am not come to alienate the country from the Sultan; on the contrary, I am a friend of the Turkish Government, and those who placed me at Massowa are its greatest allies." This succeeded in convincing the Chief of the country; but it must not be supposed that the negotiation was as short as it appears in writing. From morning till night I was obliged again and again to bring forward the same opposition in a different form. At last the men from Mader found themselves beaten, but on leaving they promised to send a boat express to Ahmed Mahomed, who would soon cause me to retrace my steps. This gentleman is a Somali merchant established at Bucker, who by his riches has great influence in this country. Not to leave any fear in the minds of my friends, I told them that Ahmed Mahomed would regret it very much if he placed himself in the way of a Consul; but in case he should, I should not omit to uphold my friends and humble my enemies.

I was very sorry to be obliged to leave here my hypsometer, all the spirits of wine having upset. Our mules arrived at 4 P.M. About 5·30 we left the village, accompanied by the benedictions of Abdulla.

We crossed a dead plain, wanting in trees, covered with herbs which come up imperceptibly. The soil is very light; the sand is interrupted here and there by fragments of coral. After two hours' march we left on our right an isolated hill, descending in a torrent with a forest of sayal acacia (babul), in which are hidden the houses of Fridello. On the way (part of our march was made at night) we encountered numbers of herds of sheep, and sometimes saw an isolated shepherd's hut.

III. FRIDELLO.

On our arrival they conducted us towards a "das," a hut made of branches in the form of a cone. In front of the das there was an enclosure of thorns, where they had prepared a fire. Chief Asa Ali, son of Asa Nakoda, presented himself a few minutes after. He appeared about sixty years of age: his face expressed intelligence, but above all cupidity. Amidst the long salutations, they naturally demanded to what they owed the honour of my visit. I answered, that "in Europe more is thought of having visited a strange country than of having killed one hundred men. Being compelled by duty to remain some time at Massowa, I took advantage of every holiday to refresh myself by wandering in the desert." Asa Ali understood this, and said: "I also felt the same when I visited the country as far as Rohaita, but, unlike you, my name was known everywhere, and I was sure of receiving everywhere a warm welcome." After this conversation he allowed us to go, and sent us some milk for dinner. On the 12th June he sent us more milk and three sheep. Soon after he came to see us to commence negotiations, which lasted without intermission till the 15th June, the day of our departure. During these four days it is difficult to forget that we never had the house to ourselves. Our presence attracted all the idlers from far and near. Some came to take part in the deliberations, others out of curiosity. Instead of making us pay, they ought to have paid us poor creatures, for doing "exhibition of whites" for them.

Asa Ali (Asa means "red," although our friend is very black, but it is an epithet of nobility) began bargaining alone, and it was only after having settled the business that he called the others into council; it was then only form, because they shared very little in it.

This negotiation might never have been finished with these interruptions, and people continually coming in, amongst a people where politeness is unknown—in a country where two men cannot speak together for a quarter of an hour without being surrounded, the listeners being brought together by curiosity or jealousy. The negotiation, therefore, required an amount of patience which my reader will hardly possess; but, that he may know these people, I cannot spare inflicting on him the principal features of this palaver. I first of all told Asa Ali my purpose, and demanded of him the safe conduct of myself and companions as far as the Salt Market. He threw every obstacle in my way, but at last he promised to help me to the best of his ability. He told me of conversations held by Europeans with him, when they proposed, some time back, that he should give them the island in front of Amphilla; "but my son," he said, "who was charged with this business, died, and it remained unfinished. To-day I am again ready to re-commence the negotiation." The old Chief probably thought that my journey had more important ends than it really possessed. I replied to him, that I was not then authorised to enter into any affair of the sort, but that on my return I would lay any proposition he liked to make before my superiors. After this interview Asa Ali called together all the principal members of the Dumhoita aristocracy who were near, the most powerful among whom is Mahomed, son of Osman, but he was at Buri, so that there were only two branches of the Dumhoita represented—that of Ali

Refferto, by my host, and that of Gâs, by Asa Mahomed. One word about Asa Mahomed. He is grandson of Ali Gabeyto, who received Mr. Salt in 1809, and accompanied Mr. Coffin to Agamé. Mr. Salt's description will do very well for the grandson. He is a man of about thirty years, tall, with a manner tolerably prepossessing; he has a good deal of energy both for good and evil. He has spent most of his life in the desert. I think he was for a long time a brigand. He knows every mountain and by-way in the country. He is also impertinent, vain, false, and a storyteller. But he could be useful, if it were his interest to be so. He is known and respected by all. He is altogether the ideal of Ulysses, in the costume of Afar. While he was our guide, we had plenty of opportunity of appreciating his different qualities. Besides Asa Mahomed our host was assisted in council by the Chief of the Dahimela, through whose territory we had to pass. His name was Ali Kefer, who was quite unknown either for good or bad. The Grand Chief of this tribe lives not far from Fridello; the Dumhoitas think themselves quite strong enough to allow him to remain close beside them. Ali Kefer was simply allowed in council, being strong enough to protect us face to face with his tribe, but too feeble to be admitted into the distribution. Then we had a long conversation, in which the Chiefs repeated Asa Ali's arguments, with variations *ad libitum*. To give some idea of the manner of talking in this country, I will repeat, word for word, a piece of our conversation; but I must say that every phrase, which is as short as possible, is followed by a pause, which is filled up by the auditor with the exclamation "Ehe!" In talking with us, the conversation was translated phrase by phrase. When the loquacity and the slow pronunciation of these people, and the length of time it takes to translate, are taken into consideration, it can easily be imagined that the smallest amount of business takes an hour. Asa Ali speaks:—

"*D.* I wish to speak.

"*A.* I hear.

"*D.* God conducted you here.—I never knew you before.—How did you come?—How can I send you back?—But what about your journey?—The sun is hot.—Water is scarce.—The road is long.—And full of thieves.—My brothers are dissatisfied.—Why show the country?—They say your heart is with the strangers.—They have given you plenty of money.—And you have sold them the country.—They say this.—But you know it is false.—And now.—How many people have come like you?—And have offered me money to go into the interior.—But I have not let them.—And now.—I will refuse you nothing.—But do better.—And come back in winter.—When there will be no sun or heat.—And then?—We will inform our brothers of Doga.—That they shall receive you well.—I have said."

This example gives but an incomplete idea of their primitive eloquence. Of course the end of all this is to render the passage as expensive as possible. The price once fixed, all objections fall as if by magic. After the affair was virtually settled, the Dumhoitas upset all again by their impudence, in saying that they would only conduct me as far as the Salt Lake. I told them I had not come all that distance to see a desert, and begged them to reflect on all the advantages they were renouncing. The night passed in council, and during the morning of the 13th June the matter was finally settled. Asa Mahomed was appointed guide and principal, and in animated terms promised to take me everywhere.

Some explanation may be here offered of the difficulties which meet the traveller on entering the Eastern Coast of Africa. They are partly owing to the wild nature of the coast, which forces the inhabitants to lead a wild, untamed life. But this is not sufficient reason. The country, though in reality exceedingly poor, is rich in their imagination. The belief in the existence of precious stones is general, and is connected with their faith in the supernatural, which produces things foreign to the nature of their country. There is also an historic reason. The empire of Abyssinia formerly extended as far as the coast, which was guarded against foreigners by a vigilant police. It required the Emperor's permission to enter, and it was almost impossible to get out again. After the Jesuits, in the fear that the Portuguese would take vengeance, the mistrust of strangers became, if possible, stronger, and the Chiefs had orders to watch them.

It is true that these orders were more often than not disobeyed; but the consequence is, that up to the present the Chiefs on the coast think they have the right to place every difficulty they can in the traveller's way, and to impose a toll. It is thus that the Naibs of Arkiko extracted, as late as 1840, enormous sums from travellers who wished to enter the interior. Again, we must consider that our conduct makes them fancy they are rendering us a great service by allowing us to enter. No one comes from so far off for nothing. Scientific ends are not understood by these savages. They think we should never encounter all these dangers without some strong motive, such as treasure to be found, &c., so that we cannot be astonished when they make us pay heavily. It must not be forgotten that the natives understand perfectly that it is better no one should know their country—that this is the only safeguard to their independence. To show their country to a stranger is, therefore, a national crime, although the native who gains anything by it forgets his patriotism very soon.

When the principal negotiation was finished, we attempted to procure camels; but as they treated us in this also with intense cupidity, asking absurd sums for the most feeble animals, we contented ourselves with donkeys, getting four very fine ones for a moderate price.

It is difficult to imagine what intense longing we felt to get into the open country, expecting every hour that some new Chief would come and annul all that the others had done for us, or that our present hosts would repent. As our advent had made a great sensation, an immense number of people came, each with the hope of receiving something from us. What troubled us most was the conduct of our future guide, Asa Mahomed. Every moment he had some fresh idea or new dodge to annoy us with. We had hardly bought our donkeys when he came to us in a very bad humour, with a camel he had kept in reserve, belonging to one of his friends, which he intended us to buy. On hearing we had already made our purchases, his rage knew no bounds. In the most insolent language he told us it was impossible to proceed without camels; and when I told him he should have informed me of this before, he threatened he would not act as guide to people who would not listen to reason. I said to him, "As our guide, your future duty is to take care of our interests, not those of your friends." Asa Mahomed was not sufficiently abusive to deny this, but was sharp enough to answer me laughingly, "In money matters I shall always take the part of my compatriots, but in any danger I shall be entirely yours." This explanation was certainly not consoling, but we brought all our patience to bear and let him talk. Once in the interior, I said to myself we will no longer be at the mercy of these people; now one word of impatience would spoil the whole affair.

I became at last so accustomed to these people that I was able to repay them in their own coin, by giving them as long harangues as they gave me. As we had settled to leave on the 15th, Asa Ali, who was doing his best then to expedite our departure, said that I should take the oath of friendship. I could hardly refuse. Witnesses are required. Mine was Synd Ibrahim, his son-in-law Mahomed. The formula, accompanied by a malediction in case of treachery, is pronounced by the witnesses. We swore everlasting friendship. Asa Ali took an oath to receive well any one who came to him from me. After he had finished, it was the turn of our witnesses to swear to guard the secret. That evening we talked a good deal of the political situation of the country. Ali begged me to do my best to make Amphilla a commercial port. I told him I had thought of it, but I did not know how far I could help him to realise his wish. He also prayed me to return to his country later, and promised to show me the whole of it.

As we shall so soon leave our host, it is but justice to say, that, notwithstanding his cupidity, he is a firm friend, frank and courageous. It is a pity his sons do not resemble him more. The eldest, Nakhoda, a young man, very amiable and kind-hearted; but he cannot make himself respected by his people, who think good-humour and kindness are weaknesses. He is too good to them, and no swaggerer. He is not covetous or ambitious, and is small and delicate. These qualities are not held in very high esteem here. The youngest, whose name I have forgotten, is a self-sufficient and wicked boy. One day he had been helping us to catch my mule, which had got loose, and it took us an hour to secure it. Soon after, the young man entered my tent, looking very serious, called the dragoman, and in two different ways explained what an immense service he had rendered me, at the cost of what trouble and devotedness, and trusted we should give him at least two suits as a reward. I intended to have given him a little tobacco, but his impertinence incensed me so much that I told him he had only done his duty. "It appears," he answered, "as if you did not know who I am." "On the contrary," I said; "it is just because I do know who you are, son of my host, that I consider your demands misplaced, and I deny your right." When we left, his father sent him with us; he remained most sullen, and I was glad when, on the Salt Plain, he decided to return.

On the morning of the 15th June I descended the torrent to look at the wells of Kummalish. The water here is good and abundant; the depth is from 10 to 14 feet. After my return we packed our things, and started for the interior at 3 P.M.

IV.—THE JOURNEY TO THE SALT PLAIN.

We advanced on the plain, and directed our steps towards the hill "Senado." There is little grass, plenty of pretty mimosas, and here and there an isolated hut. The ground is sandy, with a few coral-rocks. Often the hollow sound under our feet suggested caverns, and made our guide rave about unknown treasure. In the evening we left the hill to our left, and entered a valley surrounded by mountains. We slept in the bed of the torrent, where there is very good water 6 feet deep: the place is called *Sugo*.

The country from this to the Salt Plain belongs to the Dahimela. The owners of the wells at Sugo paid me a visit next day, and presented me three sheep. Sugo is surrounded by clayey hills. I saw many stones with the imprint of plants on them. I am sorry to say I lost the specimens. There is very little game in this valley, a few gazelles and wild asses. During our journey I saw none of them, but, from the description given me, it is the same animal as the wild ass of Taka (Soudan), of a grey colour, with black stripes, with a head like a horse. We saw plenty of pretty asses, whose parents were wild.

Having found a man here who agreed to take charge of letters as far as Mader, from whence there are often boats going to Massowa, I announced our whereabouts to Colonel Merewether; but this letter never having arrived, I suspect a political stroke on the part of the Mader people. We only left Sugo at 5 P.M. We again followed the torrent for a little while, which led us towards a chain of hills which we had to pass. The torrent is hemmed in by rocks; the ascent is rapid, but not very steep. The eminence here, Didik, forms the separation between the sea and the Salt Plain, ending towards the south in a large and high mountain, it is prolonged to the north a long way, preserving its hilly character.

We saw very few habitations, but there are several dispersed about. Before entering the defile, Asa Mahomed told us that the Dahimela were angry that we passed without their permission, and they were waiting for us at the top. He said, "Prepare for battle; we shall be in front, and when we meet any one don't interfere before seeing blood run." It was, therefore, with anxiety that we mounted the hill, but there were no enemies. On arriving at the top we descended on the other side, following a big torrent, and there we passed the night.

On the morning of the 17th June we followed the same torrent for two hours. It is surrounded by hills, void of vegetation, but consisting of slate with felspar and iron. This arid chain is inhabited by goat-herds. By degrees the range becomes more open. We leave the torrent on our right, and after passing a plain without any vegetation, and covered with stones, we descended into a deep ravine, where we found at four feet drinkable water. With the exception of a few stunted sayuls (Babul), there is not a trace of vegetation. We passed a most miserable day in this hole, scorched by the sun and deprived of all air,* watching our poor animals munching the thorns. At noon the heat was suffocating. We heard thunder towards the south-east; it clouded over, and we hoped to have rain: it did not, however, reach us. In the evening we followed the same torrent, which enlarges gradually, and is covered with rich vegetation; but so interrupted with boulders that marching is difficult. Very soon, to cut short a long détour—the torrent making to the south—we mounted a plain which follows the torrent at an elevation of 100 feet. It is completely level, and covered with fragments of flint, without a tree or shrub or grass.

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* It must be recollected this was in June, the hottest month in the year.

After sunset we again descended into the torrent, which passes between small hills. It is called here "Woraris." Its borders are covered with bushes of the Doom palm. They told me that, long ago, there was running water here, and that even now water would be found at a very little depth.

On the 18th June, leaving the torrent on our right, we crossed the last rampart which separated us from the salt basin. It is an irregular plain, with crevices and ravines so numerous that there is little more to be seen than a ridge. The whole is formed of gypsum, covered with pieces of shell and quartz, with veins of talc, of which there are large transparent pieces. Arriving at the edge of the rampart we saw below us the magnificent Salt Plain, bounded on the south by the volcanic Artali, and prolonged into infinite space on the north. On the south-west hills are visible; behind them again some black mountains; and at the horizon you see the grand chain of Abyssinian mountains emerging from the vapour and mist which covers the whole plain. I regretted deeply that there was not even a puff of wind to raise the vapour, and enable us to see the African Alps.*

We descended now 100 feet, and arrived on the level of the plain, crossing it where the fresh water from the torrent struggles with the salt and produces sayal, acacia, and coarse bushes. We encamped at last on the borders of the veritable Salt Plain, which is marked by a line of palm-trees. We encamped under the shade of a group by the side of a well, which at a depth of 3 feet gives abundant water, though a little brackish. Here we passed the day.

V.—Crossing the Salt Plain.

Mankind are easily pleased in their choice of a country. All these groups of palms, which mark the real interior of the Salt Plain, are inhabited by some families of the Woyta tribe. They live on the juice or wine of the palm-trees, which they draw morning and evening by making incisions in the trunk. They sometimes exchange a goblet of this beverage with travellers for some flour. Their houses are simply the palms, under the shade of which they live, increasing the shade a little with dry branches. Houses and tents are unknown. Each family has its own group of palms, which they have the right to do anything with they like; this is their only property. No domestic animals could live in this fiery climate; but when man has once settled down here, should he ever emigrate, the recollection of the wine of his palms induces him to return to his simple life. At my desire, one of the children brought me a goblet of this wine or milk. The goblet was cut from a Djarid (branch of a palm), and so well made that not a drop escaped. The drink resembles milk-and-water, very frothy, and tasting like cider. The fermentation is so quick that it cannot be kept from one day to another. It is strong enough to inebriate those not accustomed to it, but it is astonishing that it is capable of nourishing these people. I saw several very good-looking people, who came to draw water; and especially the boy who brought us the wine had a charming face, fresh, full-cheeked, and very amiable. I gave him some tobacco, of which these people are very fond. He showed his contentment in a way very unusual with Africans.

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* They are plainly seen in the cold season.

We had the whole of the day a strong northerly wind, nearly a storm, most frightfully hot, bringing clouds of dust, which obscured the heavens and the scene, not allowing us to see 100 yards off (this wind blows all the summer). Hot winds, with a salt vapour, the mornings calm and heavy, and these siroccos all the day. This is the life led by these people.

I must not forget to say that here our guide, Asa Mahomed, told me that he wished to make a new contract with me, the old one having expired on the borders of the plain. I did not answer him.

As it was impossible to march during the day with this burning wind, we waited till the moon was sufficiently above the horizon to light our road. It was nearly 9 o'clock when we started. All our people had bought sandals (shoes) cut from the Djarid, so that they might not spoil their own leather ones with the salt. The first part of the salt basin is sandy, but, after a short distance, clay appears on the top, and every now and then we found a rain-ditch with powdered salt in it. After 1½ hour's march we found a line of potasse trees, otherwise no tree or bush. The soil by degrees becomes of a greyish tint, and further on resembles a frosted ploughed field; but at the end the bed of salt becomes more thick and hard, and presents the appearance of a lake frozen over.

It was a magnificent night; the full moon lighted this grand and most striking—even terrific—scenery; the illusion of snow and ice would have been complete but for the heat. It was a pleasant ride; we were encouraged by a cool, fresh wind from the north. The hard soil made our march easy. The nearer we approached the Salt Plain, the more unequal and furrowed became the soil, on account of the salt which cropped up; but it is alongside the isolated hill of Asali itself that the salt becomes a stony bed. It was a night never to be forgotten; but there were drawbacks. The hot wind during the day had made our legs stiff; our mouths and skin were full of salt; our poor donkeys, half-starved, marched with difficulty, and every instant one or the other was down. But the greater disagreeables came, of course, from our guides. We had hardly been marching two hours when Asa Mahomed called a halt, and stopped. Knowing the man, I continued the march without paying any attention. We could not mistake the road, for it was a black line on a white sheet. Asa then sent Mahomed Zoula to me, who found himself in a predicament between his friendship for us and his fear of his brother-in-law. He came and said, "Asa Mahomed insists on remaining here. It is too late to arrive at the end of the Salt Plain to-night, he will guide you there in the morning; you can there buy water." I replied, very briefly, that every one might do as he thought best; but that I had no ambition to pass to-morrow in the Salt Plain. I would give Asa Mahomed permission to remain and sleep, and begged his messenger to give him my "mana" (adieux). I soon saw Asa Mahomed and his troop rejoining us. He said nothing to me, and we continued our march, which the Dumhoita strove to shorten by singing heroic songs and dancing a war-dance. I should have found great pleasure in listening to them; but at the moment when they began showing their teeth, and we did not know whether they were to be our friends or enemies, they were not to my taste. The comedy was repeated after another hour's march. The troop commanded by Asa Mahomed sat down on the ground, and appeared as if they intended letting us proceed alone. Their intention was to intimidate us, and force us to make a new contract with them; but, as we paid no attention, the brave people again resigned themselves, and we continued our march. But Asa Mahomed declared to me that he intended returning after we had crossed the plain, that he was tired of us, and was not obliged to go further. This was not true, but there was no use disputing it. I only told him that his actions were quite indifferent to me. After this scene we continued our march in two divisions, my people moving the first. The number had been augmented by a Dumhoita merchant, named Ali, who joined our caravan at Sugo; he was going to Doga to sell a musket. The second, composed of the Afars, followed at a distance of 300 paces.

At last we saw in front of us salt-fields, close to the hill of Asali. We passed a few deserted salt-pits, where the crumbling soil and pieces of earth were proofs of former excavations; the salt forming again had not had time to smooth the earth. Soon we saw another piece of ground, surrounded with trenches and heaps, and some men working. We stopped about 200 yards off, as it is dangerous to appear suddenly amongst these men without their knowing who you are. During the march Ali, who was jealous of the guides and saw their bad faith, saw his hour was come, so he began blaming the others and offered his services: "Wait near the salt-pit, and I will join you. I shall no doubt find some friend amongst them; it is the caravan of the Chief Hodeli. I will go, and when I tell them you are going to that Chief they will let you join it." Ali went in front; our guides also went and spoke to the men at the pit, while we held ourselves in readiness for fighting; but after a few minutes they came, and made us encamp on the salt. The caravan, which was encamped close to us, was that of Hodeli; it was to return to the highlands in the morning. Asa Mahomed brought me one of these Chiefs, who talked a long time, trying to dissuade me, at the instigation of Asa Mahomed, from continuing my march. "If you must go on, absolutely, you must conciliate your guides and follow their advice." It was becoming most ridiculous, for Ali at the same moment brought and introduced to me a parent of the Chief Hodeli, who asked me to travel with them as far as the market. These intrigues of Asa Mahomed were therefore labour lost; he had really hoped to extort from me a large sum of money; he resented his bad luck dreadfully, and wished to return. But at this moment Nakhoda, who had been so good and quiet all through, and had never opened his mouth, came and said that he intended accompanying me through, that he had promised it to his father, and that it would be an eternal shame to him if he abandoned me in the middle of the desert. This frank declaration decided the affair. Asa Mahomed's companions, who could not hope for any presents, decided on returning from here to their own houses. I was very pleased at this, because they consumed the provisions and were of no use. Asa Mahomed decided on going on with us, which I did not refuse to allow, as his knowledge of the country and people made him very useful, notwithstanding his other qualities. We passed the remaining hours of the night lying on the salt.

The 19th of June we started again at sunrise, at the same time as the caravan, which consisted of camels, mules, and asses, heavily laden; there were also a number of women and girls, who carried salt. On the whole, there were more women than men, both Dumhoita and Abyssinians. Asali* is not very far from the border of the Salt Plain: the last part of the latter is quite different to the former; the soil consists of white clay; it becomes a regular pool. Everywhere the water moistens the earth, and there are many places where the water gushes out. The caravan kept to the marked route; one false step and animal and man would disappear, never to be seen again. The border of the basin is exactly like Kottahari, where are some palms, acacia, and herbs. We found a well with a very little water in it. On this side also the basin is bordered by a wall of gypsum, which extends as far as the brow of the mountains, but is more accidental and not so large as the east wall. As we were too tired to go on as far as Sabba, where the caravan intended halting, we passed the day in a dry torrent, close to the mouth in the salt basin (Handeda). As we are going to enter a new country, I must make some observations on the Salt Plain.

VI.—General Observations on the Salt Plain.

The name of the "Salt Plain" does not well express its character. We prefer using the name of the Salt Basin, for from the showing of the barometer there is no doubt that it is below the level of the sea. The more or less salt found there is quite a secondary thing. The length of the basin from north to south is 45 miles, and from east to west about 20 miles. The Salt Basin separates the desert hills of Arrata from the terraces of Doga, and receives the waters of both. The basin is surrounded on all sides by a high wall of gypsum, which is often penetrated by the torrents which fall into the basin; it is only to the north that the wall is continuous, and forms a separation for the waters.

The south part of the Salt Basin is formed by the volcanic mountains of Artali, which have a peak from which smoke continually issues. The Salt Basin is not of the same nature all over; it is divided into an outer and inner circle: the latter is altogether influenced by the salt, and barren; the outer circle is separated from the inner by a ring of palms, and has vegetation. Everywhere water is to be found at very little depth, but the east side is quite dry, while the west side in its whole length forms a morass, and at its south end has a lake, which is much exaggerated in the maps. It is 6 miles long, the same width, and 1 to 4 feet deep. The number of streams falling into the lake is considerable:—

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* Name of the hill and salt-field.

1. It receives water in the south from the Didik stream.
2. At its extreme southerly point the waters of Ala, from the declivity of Dessa.
3. The River Rira Guddy, with its branches from Ayba, Efisso, Ala, &c.
4. The River Raguali (or Awra), the only true Abyssinian river, which flows into the plain, forming an oasis there.

From the middle of the basin there arise three small hills—the peak of Asali, and two elevations elongated towards the north—which are called Dellol, where there is a little salt-pit and a deposit of sulphur, which is also exported to Abyssinia. The salt-pit of Asali extends over nearly 4 miles, but one part of it is always wasted; it forms a horizontal crust over a stratum of clay. The inferior beds are naturally wet and dirty. If a pit is drained, it takes many years to recover itself. We passed close to some, abandoned for the last four years; the crust of salt was very thin. The Afars who work the salt and prepare it for exportation live the whole year close to the plain, under palm-trees or in caverns; they make the salt into pieces, which look like whetstones, weighing one pound.

The men of the caravan are prepared to give them tobacco, bread, cloth, and even money. The people who cut the salt work all day under the shelter of a mat all the year round; they do not stop even during rain. When a great part of the pit is under water, they then establish a bed of clay, on which the blades of salt lie dry for cutting. About sending the salt to the interior we will speak later. We regretted much that the clouds would not allow us a full view of the plain and its environs. The whole time we were near the basin a thick fog enveloped the whole, and I think this veil is not often raised.

VII.—FROM THE SALT PLAIN TO ALA.

An oblique plain, intercepted by isolated hills, conducts you to the borders of the real hill-land, the first step to the Abyssinian plateau, through which the torrent Sabba has formed a breach towards the Salt Basin, offering a means of communication with the higher mountains. We arrived very late at night; we were obliged to go a long way round to avoid a large caravan of Dahimela, who were strangers to us. We no longer kept the route; our road crossed a plain covered with stones, which impeded us dreadfully, to the foot of the mountain, where we descended into the torrent Sabba, with running water. We encamped close to the opening in the torrent itself, which is overshadowed by barren and dark rocks; no tree or grass is visible. We thought ourselves very happy to have got rid of the salt, which had penetrated our bodies, but the taste we should not lose for many days.

On the 20th of June we followed the torrent Sabba, where there is almost always running water. We mounted constantly, but almost imperceptibly. There are no cataracts, but the road is most difficult from the number of boulders which obstruct the bed. The torrent takes a long circuit in trying to find a way out of the mountain, the openings of which are very irregular, forming defiles of only 10 feet, whereas the ordinary size of the torrent is 150; it is accompanied by high black rocks of slate and clay.

As we ascended we found more and more vegetation, green grass, and a few acacias, &c. We passed the day under their shade, together with a party from the caravan of Hodeli, whom we had out-walked yesterday. We met a caravan coming from Efisso, with 200 camels and 400 to 500 mules. The people looked at us with great curiosity, but showed neither friendship nor enmity. A little above this place the roads separate with the branches of the River Rira Guddy. The principal branch comes from Efisso, another from Ayba; a third we followed, an affluent which comes from the south-east, crossing the country with a slight declivity. The reunion of these three branches is called Maglalla. Having taken the left branch, we entered into the defile of Imba. It is difficult to give an idea of the beauty of this passage, when you figure to yourself the bed of this torrent, hardly 20 feet wide, bordered on either side by walls 200 feet high, forming walls and towers in squares, large and regular, of slate, sometimes joining over the torrent-bed as steps of a staircase. From here to Edelo, where we arrived in the night, we followed the same torrent, rising gradually with clayey hills. The water disappeared after two hours' march. The torrent was broken up into a number of small affluents, vegetation increased with the elevation, the country became covered with trees,—tamarisk, sayal, rhamnus, and bushes of wild henna. The hills grow a fine yellow herb, which resembles thef. The soil is clayey and very pleasant to walk on. We saw very little vestige of population on our road; some goatherds. At Edelo, where we encamped, the torrent becomes a ravine; there we found water. We had before us the mountain of Desso, round which we had to turn to descend into the more elevated terrace of Ala. After passing it, by two saddles, we descend to Ala. The country is one irregular plain. We passed three dry torrents, which are separated one from the other by low hills, and join together again lower down, under the name Methongoli, to throw themselves into the lake at Artali. The market of the Dumhoita is by the side of the third torrent, surrounded by several villages close by on the slope of the hills. Hodeli, the Chief, lives in one of these affluents, about 500 paces from the market. He lives quite alone with his wife, little daughter, and son, and two women slaves. The large torrent has water in a pool close to the market; it comes from the declivity of Desso and Wonberta, whose outlines are visible. The valley is very large above the market. We knocked at the door of the Chief Hodeli, and were received with much respect.

VIII.—OUR STAY AT ALA.

A short time afterwards the old Chief came to see us. He looks very strong and vigorous. As the morrow was market-day we did not talk of our interests till the day after; my idea was to go to Asubo-Galla. Hodeli, after becoming accustomed to us, did not raise any obstacle, but he told me I had not enough men (three were ill), the route by the Doda being really dangerous. "If you really go with those few, your asses will be of no service to you; the road is very mountainous and stony. Go to Atsbi, and try the route into Abyssinia." But that was risking too much. I was very much perplexed, as I could not in the first place abandon my men here; for then I should have been obliged to return by the same road, and the Prince of Wonberta, Cassai, who was encamped at Atsbi, could then stop me. Another consideration was money, which would have sufficed had I not had mules to buy, the latter costing from 25 to 30 dollars. It was with great regret that I made up my mind to give up my project and return. I had passed the worst part of the journey; I was no longer quite a stranger to the people, and my name had preceded me. The Doga people whom I saw in the market, notwithstanding they were very wild, had no objection to my going with them. My regret was a little moderated by finding that my watch had stopped and would not be of any service.

When Hodeli saw our decision was taken, he intimated his desire of sending us on at once. Some soldiers and followers of Prince Cassai visited me the day of the market. They wanted me to go to their camp with them; if I wished to remain a few days more, Cassai would send soldiers to escort me. I did not care about this, as the Chief was new to me, said to be very avaricious and wicked, and, above all, a strong partisan of Theodore. Hodeli wished us to go on with his caravan, but we were not ready; and the next day we heard they had been attacked by brigands, who killed 12 men and took 200 camels —a large part of the wealth of the country; but the natives are as indifferent to losing as they are to gaining. I visited the market; but my curiosity was less satisfied than the people's, as they surrounded me. There were 2000 to 3000 people in an open space beside the torrent. Salt was sold for dollars and stuff from Massowa, brought *viâ* Abyssinia, of middling quality. Commencing at 7 A.M., everything is finished at two; and the merchants resume their march for the plateau, which they reach the same evening. I found all provisions dreadfully dear, except coffee. Our life at Hodeli's house was very pleasant. There was his wife, a very pretty woman, who, when she got accustomed to us, used to visit us with her husband, and would have liked to visit the wonders of Massowa. Our host could not have been more attentive, and treated us with great liberality. When we had to leave he gave us provisions which lasted as far as Massowa.

IX.—General Geographical Observations.

After having crossed the country of the Afars from Amphilla to Ala (south-west), and from south to north between Ala and Annesley Bay, we wish to give a general idea of the country and people that we have visited.

If we look at a map of the Red Sea, we see there two sides of a triangle; the acute angle is the end of Annesley Bay, where the first line, the grand chain of Abyssinia, meets the second line, the coast of the Red Sea. The first line goes towards the south, while the second elongates towards the south-east; the third imaginary line, which completes the triangle, and goes from Zulla to the west, is determined by ethnographic reasons, because at the south of this line commences another type of people; but it is not so clearly defined, because in Africa ethnographical frontiers are always vague, each tribe making inroads on the other.

The configuration of this triangle, called the country of the Afars, is, as far as we know, very simple; first, there is the Salt Plain, which extends from north to south, and divides great part of it. If we take it as base of the partition we shall find the following parts:—

1. The coast (Sahel) from Arena to Edd, a plain rising imperceptibly towards the west, formed by the deposits of the torrents, fertile and wooded, 10 to 20 miles broad, and limited on the west by a chain of hills.

2. Arrata, a hilly country, inclined towards the Salt Plain, and sending its waters in it, stony and arid, with very little water.

3. The Salt Plain (Ragad), bounded by a wall of gypsum, which separates it from Arrata.

4. The country to the north of the Salt Basin, as far as

Annesley Bay, consisting of volcanic hills and clayey soil, covered with lava, showing extinct volcanoes, interrupted here and there by marine plains covered with shells and madreporic forms.

5. The peninsula of Buri, a magnificent plain at the foot of Mount Aouna (Hurtow Peak).

6. To the south of the Salt Basin is a chaos of high volcanic mountains, with extinct solfataras, approaching the Sea at Ayth or Edd Ayth.

7. On the southern side of these mountains is another salt plain (Aussa), receiving the river Hawash, and limited, as it appears, on the south, by volcanic hills.

8. On the west side of the salt plain, on the brow of the Abyssinian plateau, we found successive terraces, but communicating with each other; together they are prolonged the length of Abyssinia, from Agamé to Asubo-Gallas, and are called "Doga;" it is a mountainous country, cut up into several valleys by the torrents which descend from the plateau, and by the number of mountains dispersed about; but the form of these last is so irregular, and the valleys so transverse, that the country is not so sharply divided as one would suppose.

The Doga is 3000 to 5000 feet high, and partakes of the nature and climate of Abyssinia,—moderate heat, moderate vegetation, and not very shady; notwithstanding the distance, it has its rainy season *in winter*. It is much like the Habab country north of Massowa.

It is remarkable that the Abyssinian plateau, which in the grand line from Hamazen to Halai shows a rapid declivity, changes its character here, and takes the form of terraces like those to the north of Abyssinia, where they decrease successively to the level of the sea. Doga is therefore as commodious as the frontier, presenting as easy access; it is therefore another door into Abyssinia.

I will now hasten to draw some conclusions from what has preceded:—

1st. Without hazarding too hasty or rash an opinion, it appears, by the present conformation, that formerly the Salt Plain communicated northwards with the sea in two channels by the bays of Annesley and Howakel, where the bay appeared always tending to approach. Vestiges of this union are the low elongated plains, covered with shells (like Addado), but too high to warrant the conclusion of recent sea-action. At this time Arrata and Buri were islands; volcanic action raised terraces and isolated the salt lake.

2nd. It is not probable there would be any coal; and, if there was, only on the two slopes of the hilly chain of Arrata.

The watercourses have been forced to follow this configuration.

3rd. All the declivities in Abyssinia send their waters into either the Salt Plain of Asali or into that of Aussa. From Takondu to Shoa there is not a single river which runs towards the sea. The conclusion is, that the Salt Basin receives an immense quantity of water, enough to form a constant subterranean lake. As we find marked on the maps a torrent, called Mai Mena, running from Agame to Howakel, I made particular search; but I am persuaded that from the end of the bay of Annesley as far as Ayth (15° 13′ 4″) not one of the Abyssinian rivers communicates with the sea.

4th. From what we have said it also follows that generally vegetation is scarce and arid, with the exception of Buri, the coast, and, above all, the oasis of Raguali; it follows also that Arrata ought to have very little water, while Buri and its coast are rich—thanks to the quality of its soil, which retains the water; the climate also ought to be hot and feverish at Buri, where there is a great deal of vegetation. The western part of Buri, the coast, and Raguali, alone are fertile enough to admit of much population, the rest can nourish but a very few. It is therefore at Buri that the force and power of the tribe is concentrated; indeed, all the country of the Afars would be unimportant if it were not for the Salt Plain and the road to the sea, which gives it a certain political importance.

X.—ETHNOGRAPHIC OBSERVATIONS.—TRIBES.

In History and Geography, errors are propagated from book to book, and from map to map, which are very troublesome to correct. This is the case as regards the tribes who inhabit the triangle of which we have just been discussing the principal characteristics: they are always called Danakil.

It is true that there are Danakils in the tribe, but they form a third and the most feeble portion of this confederation; formerly they used to be powerful and numerous, but for upwards of a hundred years there has been no reason why the whole should be called by the name of the less number.

Salt found things as they are now, and he only imitated the Arabs in calling them the Danakils. How are we to give them any other name? The inhabitants of the triangle are simply a conglomeration of a number of small tribes, who talk the same language; this language creates a sort of nationality, and a certain similitude in living. I do not think we shall do wrong in calling them the Afars, after the language they speak.

The Afar language is a sister one to that of Shoho. Shoho and

Afar have no difficulty in understanding each other; but the Afar dialect is a great deal harder and more guttural, I think more difficult on account of its consonants and uncouthness. There are several vocabularies of this language, but we do not know enough of it to fix its place among languages. It something resembles the Galla; but I do not think that from that we have any right to conclude it has any affinity, but I hope soon to have time to study it well.

I shall give the names of the principal tribes, but it must be remembered that it is impossible to fix their places.

The Dumhoita are the most powerful among the tribe of Afars. They are said to have emigrated from the Habab country; it is certain they come from the north. They usually inhabit Buri and the coast as far as Ayth, and in the mountains the market of Ala belongs to them; but you find them amongst all the tribes, and they make themselves feared by their coolness and energy.

The Dumhoita possess a number of men of different origin, the descendants of other tribes who have become their subjects.

The Dumhoita are divided into three families:—

1. The house of Aly Keferto (Chief Aly Nakhoda).
2. The house of Asa Mahomed (Mahomed, son of Osman).
3. The house of Gas (the descendants of Aly Gabeyto).

The first family lost their ascendancy a little while ago; it is now the house of Asa Mahomed that is at the head, thanks to the energy and talent of Osman, and of his father Ahmet Goolay.

The Ankala formed formerly a very powerful tribe: now there remains very little of it. Their Chief is Moostafa, the son of Negoos, whose village is in Annesley Bay.

The *Danakil* (S. Dankali) live together with the Dumhoita, whose subjects they have nearly become; of old they had the same position among the Afars which the Dumhoita now hold, but it appears that a bad use of their power was their ruin. They all remember this so well that the Dumhoita, when they pass one of the Dankali villagers, get off their mules to show their respect for a fallen power.

The *Dahimelas* are the masters of Arrata, &c., and of all the country of Sugo as far as the Salt Plain. They live also in the mountains to the south of the Salt Plain. Their Chief is called Ali Kefer, who is obliged to manage the Dumhoita. On the contrary, in the highland of Doga, this tribe is possessed of the two largest markets, those of Efisso and Ayba; where they are far superior to the Dumhoita.

The *Belessua* hold the country to the north of the Salt Plain as far as Annesley Bay, and to the west as far as Agamé. They are called, after the different branches, Wotto, Haleyta, Bedal, &c. In the highland their chief is Mahomed, the son of Dardar, who governs the market at Kablagubbi. In the lower countries they have no chief since the death of the celebrated Abdulla Betal, who, having established himself close to Annesley Bay, forced the caravans to pay him duty, and made obstinate war against the people of Zulla and the Haso. At last the Governor of Massowa was compelled to interfere. Ahmet Aray, son of Naib Hassan, Governor of the ground, together with the Dumhoita, who were jealous of Abdulla, forced him to retire. Abdulla having found an asylum in the family of Sabagadis, he was delivered up for a sum of 1000 dollars, and his enemies took him in chains to Massowa, where he died in prison, 1865, of cholera. Since then the Belessua have been very quiet, and support the authority of the Dumhoita.

The *Hadarema* (S. Hadrami) live along the coast from Amphilla to Edd, and are to be found also dispersed in the mountains south of Amphilla. They were originally from the Hadramaut. The people of Amphilla belong to this tribe.

The *Madeyto* are masters of the country from Beylool to Aussa. The Chief, the son of Anfera, appears to have monarchic power, and makes himself respected as far as the coast. Their neighbours are the Adali, inhabitants of Tadjurra and Obok. I will add the names of some other tribes: Mandita, Subura, Asanato, Woyta, Genninto, Asaméla, Asagala, Shéka, Matanna, Wuéma, Irrónabo, &c. In the upper countries there are also the Doga, who deserve mention. They inhabit the prolongation of Doga to the south as far as Betta (Asubo Galla). They are also called Hurtow, and are a mixture of Doga and Dumhoita. Their principal establishment is 40 miles from Ala, in a large plain. They are said to be very wild. They do not cut their hair, and wear long beards; they are called Mussulmen, but they never pray, and do not approve of others doing so, as they say it stops the rain; they have immense troops of camels; they are brave men, and far-famed thieves. I saw one or two of them when I was staying with Hodeli, and they were very well made. The Hasos, the Gasos, and the Rassamos, who inhabit the slope from Agamé as far as the end of Annesley Bay, separate the Afars from the Shohos; they speak the same language as the Afars, but are not looked upon as confederates.

XI.—POLITICAL STATE OF THE AFARS.

To understand these people, it must be borne in mind that they are not all of the same origin; if the authorities for this were not so precise, we might be inclined to doubt it.

For how is it possible that language alone can create confederation? Above all, when it has to be learnt by the new emigrants, and the Menafere and the Hazowerta, how is it that they, speaking the same language, are not in the confederation? I think we must assume as the origin of the nation a people living on this coast, having unity of language and origin. When this people, in war or other misfortune, lost their national unity, strangers crept in, learnt their language, and inherited this unity, assimilating themselves in every way with them.

We see now a confederation of the wildest tribes, who without calling on God like the Turks, or the rights of men like the Americans, thought it was better to live together in peace, as all spoke the same language, and could not help it.

But what is the most surprising is that the tribes do not keep to themselves; each tribe sends its sons in every direction. Athough each tribe has its own ground, they receive, without making any difficulty, the children of other tribes; and often the strangers surpass the natives in numbers.

The constitution of the confederation is very simple; while all strangers are natural enemies, so long as they ask not for protection, every one who speaks Afar, and is born in the country, is considered in all the Afar territory as a friend, and is respected as long as he is not guilty of murder. Here ends the law; there is never such a thing as common justice; there is, however, rarely occasion to regret this.

It is only necessity which forces the people to abandon their individual liberty. Thus with the Afars each follows his own way, independent of any one else. This is explained by the fact that the country is much larger than the population, that there is no village of more than twenty houses, and that between the settlements there are many miles of desert. This isolation prevents combination for a general attack or defence; it does away with all quarrelling, anger, and ambition.

There are, however, exceptions: as it is only the absence of opportunity which creates these peaceable relations, and not political wisdom, they get troubled when a stronger necessity or opportunity arises; the stronger never suffers the weaker to be equal, if he can help it, and so we see chiefs and subjects, as all over the world.

There are among the Afars a number of small ruined tribes, probably the descendants of the old nobility of the country; they have lost their political unity, and live under the bigger tribes. This may also be said of the Danakil, who became little by little the subjects of Dumhoita. All the subjects are called "white men," while the nobles are called "red men." It is difficult to say where these names came from, as all the people are black. It is perhaps the colour of the blood gave these names, higher animals having red blood, whilst fish and all inferior animals have white blood. From what I saw, you could not distinguish between the white men and the red. The latter hold the fortunes of the others with a high hand; they tax them as necessity occurs for a cow or camel, and when they marry they are helped by them.

Between the white and the red there is the man who belongs to an independent but weak tribe; he leans to one of the high nobles, but is not treated as a subject; it is what they call to the north of Massowa "slender nobility."

It does not appear that the Afars ever had a king; but there are traces of monarchical power: each tribe has a head chief, called "Makāben," a dignity which seems to be hereditary; but in our time it is the most powerful chief who is the senior, and who usurps the title, but without having, very often, more power than the parents. When the Makaben receives a present, or does anything political, he must share the former with his parents, and without their sanction no one of his acts is legal.

One tribe lives quite independently of the other, but as soon as circumstances force them to approach, the strongest ill-treats the weak. The Dumhoita are now the most powerful from the coast to Ayth; the Dahimela are masters of Arrata, &c. Each tribe recognises the independence of the other, but should anything occur, this justice disappears altogether. This was very manifest on the occasion of our entrance from Amphilla to the Salt Plain. Only one quarter of the way belongs to the Dumhoita, the rest to the Dahimela: when they took it into deliberation, the latter were obliged to give their opinion; but when it came to sharing the benefits, they were put on one side, as also the Hadarema of Amphilla. The same thing occurred in a recent transaction. A daughter of Belessua was married to a Dumhoita, who soon died, and she returned to live with her family. Some years after, she was confined of an illegitimate son, who was brought up by the Belessua; the father was unknown; the child at the age of fifteen years, while playing with some children, was hit by a stone and killed. To whom belonged vengeance? The Belessua said it was only their affair. The Dumhoita said the woman was the widow of one of their tribe, and that a Dumhoita was the father of the child. The Belessua replied that the woman was free, and returned to her family; as to the paternity of the child, it was too late to claim that now. They had reason, but, notwithstanding that, the Dumhoita thought them wrong, and would have enforced their belief if happily the cause had not reached the Turkish tribunal of Amphilla, which I think will do justice.

From what we have already related of the political life of the Afars, one would suppose they were an independent people, but we must define this independence. As to the past we know nothing, the natives having no memory for history. But in the time when Imam Ahmed, the left-handed, was about to convert and conquer Abyssinia with the help of the Turks, we cannot doubt that a large part of his army were Afars, while he himself was of the Adali tribe.

The first traveller who furnishes us with details of the country is Mr. Salt (1810), and what he says still applies to the present time. From his time the Dumoita have had the upper hand, as they have now; the men he had to deal with were the grandfathers of those with whom I treated. Nothing has been altered since: the naibs of Arkeko had then already a great influence on the tribes; their policy has remained the same. Incapable of conquering the country, they did their best to close it to strangers, especially Europeans. Between 1810 and 1860 they had fifty years' rest, during which time the Turks did not invade the country, contenting themselves with the vague title of masters of Abyssinia; but they never lost an opportunity of declaring that the whole coast belonged to them. Sometimes the Governor of Massowa sent an armed ship to Amphilla to remind the natives of the Sultan; it was in the time of the princess of whom we have spoken above; there was an appearance of Turkish sovereignty, but without the natives having abdicated their right to alienate their country. In that time a French company bought Edd, which has now been bought back by the Viceroy of Egypt.

In 1860 all was changed. The Governor of Massowa, Purto Effendi, who governed without soldiers, and enriched himself without making the people discontented, received the order to take possession of the coast, and did it. He was simply to persuade the natives to sign the declaration of loyalty, and to fly the Turkish flag in all their ports. This naturally was to be done without violence. Purto handed the execution of the order over to Ahmed Aray, the most capable member of the family of naibs, a man who had already distinguished himself on several occasions. Ahmed Aray made Osman the first chief of the Dumhoita his partner, who had no trouble in persuading his countrymen. Instead of demanding tribute by paying presents to the chiefs, Ahmed Aray, without any difficulty, planted the Turkish flag from Zulla to Ayth, and caused to be recognised the supremacy of the Sultan as far as the Salt Plain.

The people of Beylool and Rohaita alone refused, declaring themselves dependents of the king of Aussa, who would hear nothing of the Sultan. The southern extremity of the Red Sea was left at the mercy of speculators. The French profited by it, and bought Obok. This affair was very advantageous for Osman, because his being Chief of the country became notorious; perhaps he would have gone further, and made himself known as Chief of the whole coast, only he was killed in 1865 by a troop of Abyssinians, who came and plundered Buri.

Ahmed Aray died himself in 1866, of cholera, at the time that the Egyptian Government had constituted him Chief of the whole coast of Afar. The advantage Osman gained in aiding the Turks was shown on the occasion of the fight against Abdulla Bellal; there is no doubt the last Chief committed numberless crimes, which in civilised countries would have been punished with death, but which in him were excusable, because they were committed in a legitimate war between tribe and tribe. But by his influence and energy he might become dangerous to Osman. He would probably have established the ascendancy of the Belessua to the destruction of the Dumhoita: he was therefore prevented reconciling himself with the Government; they forced him to extremes that they might punish him—a wise government would have reconciled and used him. But, unfortunately, there is no doubt that every conquest the Egyptian Government made in the Red Sea or in the Soudan was by helping the strongest native Chief to beat his rival.

The Egyptian Government took possession of Massowa on the 30th May, 1866; and some days after the Ibrahimya went to Ayth to establish there a garrison of 300 soldiers, but the place displeased the general who went with them so much that he returned with them to Massowa.* Since this time the Governor of Massowa has distributed amongst the principal Chiefs of the country dresses of honour, but the country pays nothing to the Governor.†

They have lately established a soldier post at the end of Annesley Bay (Arafali), a place well situated, commanding the little salt plain of Buri; there is a garrison there of 100 soldiers, who take a duty on the salt.

The Afars commence to see the advantage of being governed by a regular government. They do not yet know the trouble it will bring them, and think their submission is all that is wanted; but their days of independence are undoubtedly at an end. Egypt, like all young powers, shows in all its commencements a fictitious energy which deceives itself at first sight; it no sooner receives a new province from the Sultan, than it talks as if it would renovate everything; but, after a good deal of fuss, it settles down in the old routine. The Egyptians will not take long in taxing the Afars and establishing ports; they felt astonished that the Turks had done nothing during their long reign. If this was only caused by the proverbial laziness of the Turks, it could easily be changed; but the Egyptians will soon find that it is the nature of the country to be independent, because it does not repay the trouble of occupying it.

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* Since a garrison of 60 men has been put there.

† Buri is to pay this year 500 dollars (1868).

The Egyptians have their eye also on the Salt Plain; but I think that, notwithstanding its great importance, they would find the sacrifice of men and money too great, and perhaps the prize, when taken, would have so much the appearance of an invasion of Abyssinia, that Europe generally would disapprove of it.

XII. THE MANNERS AND CUSTOMS OF THE AFARS.

We had not time enough to study these people; but we conclude, from what we saw, that their customs and private life must be very curious. It is difficult to speak of the physical qualities of the Afars, because, from the different origins of the tribes, the types also are very different. The colour is generally black, while at the same time there are shades to the clearest brown. I observed that the Dumhoita were fairer than the other tribes; all the features are Caucasian, with the exception of the mouth, which everywhere in Africa is very large, and the lips thick. They have noses of all sorts; the most common is the "turn up." Generally speaking, you would call the people handsome, men and women. The people of the interior, above all the inhabitants of Doga, are very heavily made; they are taller, and have larger hands and feet than the coast people. Generally the Afars resemble the Agow, and the Doga the Gallas. I did not see an example of obesity.

The Afars have hair tolerably fine, short, and straight; it is always black. The men let it grow freely in tufts; the women dress their hair at the back in the same way as the Abyssinians. The people of Doga have hair and beards more abundant, and are higher and stronger built; the coast people finer, hands and feet beautiful, good teeth, except on the Salt Plain. The Afars enjoy robust health. On the coast there are some very old men; in the interior, so many being cut off by war, old age is rare.

The sicknesses most common are intermittent fever and ophthalmia; syphilitic diseases are quite unknown. Cholera raged here in 1865, and made dreadful ravages.*

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* A seeming proof against its epidemic character, considering the distances of the settlements.

The dress of the Afars is very simple: the men wear a piece of calico forming a mantle, another covering the loins, and a strong belt; rich people wear coloured stuffs and silks. The only luxuries are in the way of weapons, which consist of a curved cutlass, which they fasten on the right side, an enormously long and heavy spear, and a large round shield of buffalo-hide. Many add an English sword; no one has firearms. Even little children of ten or twelve years old carry at least the cutlass, which is never taken off except in bed. The arms are well taken care of, and of good quality; as much cannot be said for the clothes. They are seldom long enough to cover the body, and are rarely washed. The people of Doga are not different from them in this way, but their arms are still brighter, their lances gigantic. One thinks of the heroes of the 'Iliad' when one sees these vigorous men over six feet high.

The women are still more simply dressed than the men: a piece of stuff covers the head and falls on the shoulders, a piece of tanned skin, the lower part ornamented with shells, round the loins, falling as low as the feet. They wear very few ornaments; brass rings in their ears, chains of brass and shells in front, bracelets of camels' skin—silver ornaments are very rare. If they may be considered beautiful, their beauty consists certainly in their fine persons only. The houses of the Afars are not better taken care of than themselves: it is generally a rude mat tent, very small and low. Sometimes they are replaced by conical huts made of branches of trees, covered with leaves or grass. On the Salt Plain we saw houses of branches of trees, and often only caverns. The drinking utensils are made of wood or leaves of the palm, very neatly worked; they have neither tables nor chairs. The bed has the feet fastened in the ground, and on it a cowhide. They have goats'-skins for keeping water.

Their food consists of polenta, with milk or butter; it is only the Doga people who drink beer or tedj. The Afars are very fond of tobacco, which they use in every way; men, women, girls, and little children prefer a little tobacco to a piece of bread. The Afars are wandering shepherds; they have never tried cultivation. Some of the people on the coast, however, tried commerce, and they have boats in which they export butter and djerid, returning with durra, date, and stuffs.

The domestic animals of the Afars are camels, cows, goats, sheep, and asses; horses and mules are very rare. I saw very few dogs or cats. The camels are very fine, particularly those of Doga and Madeyto; those of the coast are small. The price up to the present was very reasonable; but the great demand for them at Massowa, and the great gains they realise in the salt trade, raised the price to 20 or 30 dollars each. The greatest number of camels are found near Ayth, belonging to the Dogas and Dumhoitas. The Belessua have only cows. The inhabitants of Doga do not breed camels, but they buy a great number of males to carry salt on the coast, where the camel is rarely employed; they use no saddles. I have often been surprised at the bad condition of saddles in Africa, which are never fit for use, they only hurt the animal's back, and are always badly put on; all this, notwithstanding the experience of hundreds of years, during which time the camelmen have had no other occupation.

The Afars have very little trouble with their flocks, except in giving them water; they graze without any one looking after them, thanks to the scarcity of thieves and wild animals. During the morning the animals come of their own accord to the wells; in the day they are in charge of the children and girls. The women are engaged carrying water from the wells, and preparing the food for their husbands—also in making mats; whilst the men occupy themselves in carrying and polishing up their arms, and watering the animals. The women hardly hold the same position as in Mussulman society. They do not hide their faces, talk with whom they like, salute strangers without shyness, and work much both indoors and out; but they are considered by their husbands as very inferior beings, and often ill-treated, and even beaten, although they are good companions and very active. The only thing they have in common with the people of Massowa is that they can neither eat with or before their husbands. The women of Doga have the same manners and customs as the Abyssinians.

Marriage is often preceded by an arrangement; the husband pays a marriage price and advances a sum of money to the father-in-law, which is returned with interest some time after the marriage. Often the man and woman prefer not going through the official form; they live together in concubinage, which is not considered dishonourable, until a child is born, when they get the blessing of the Sheik of the tribe: children born so are legitimate. It is exactly the same as with the Barea.

A woman or girl who becomes with child without being married, or living in fornication, is not despised or scorned. The father, with the greatest pleasure, if no one claims the infant, adopts it himself, and calls it "Yelli Baho," which means, "God has given."

The former Chief of the Dumhoita, Osman, never gave a daughter in marriage without formally stipulating that the children belonged to him and not to the father's family. To ensure this being adhered to, he compelled his sons-in-law to live with him.

If a girl already engaged has an illegitimate child, her future husband is not at all displeased, having the right of adopting the child as his, and forcing the seducer to pay a heavy sum of money. I have a friend amongst the Dumhoita, called Yelli Baho; he is a bastard. A little while ago a girl of the country to whom he was engaged gave birth to a son. He was very much pleased, adopted the child, received twenty cows from the real father, and I believe still intends marrying the girl notwithstanding. The Afars are so pleased to have plenty of children, that they forget all delicacy or jealousy.

There are no public women among the Afars; but for that, morality is not at a very high standing with them. The women are said to be very faithless, and the men indifferent about it. There is polygamy among them, as there is everywhere else; but it is exceptional. They say that the Hadarema, to the south of Ayth, offer their wives to strangers, like the Amarar on the coast of Sonakyu. Amongst the Asubo Gallas this custom forms a necessary part of hospitality.

Up to the present we have found that these people are devoid of all culture, and it is to be feared that they are equally limited in their knowledge of God. In name the Afars are Mussulmen, but in religion they give as little to God as they do to the Sultan in political matters; they acknowledge both, but pay no tribute to either.

The people of the coast, priding themselves in being connected with Arabia and Massowa, commenced a short while ago to pray and fast during the Ramzan; but the people of the interior, 10 miles from the sea, know neither prayer nor fasting, and not even the name of the prophet. The name of God is sacred everywhere. Some of the tribes are angry if even a good Mussulman who happens to be among them prepares for prayer. But, with or without prayer, the Afars worship the Devil more than God. There are sorcerers (Sahar) among them, rainmakers, spirit people (Burridoo), who pretend to have power over everything—who, intoxicated by songs and the sound of the drum, make predictions; their word is firmly believed. They believe in amulets for love and hate, as well as to preserve from danger. The greatest sorcerer they told me was the Chief of Aussa, and he was always surrounded by master sorcerers; he knew even how to make ice! The "Bouda" devour men, transforming themselves into hyenas. Special adoration is not missing either. Every year, on the summit of the mountain Yalwa, they take a cow for a sacrifice. Every one goes, guided by the sorcerers, who pronounce mysterious words; the meat is wrapped up in a skin and placed on the pyre. At the moment when the flame commences to lick the victim every one present flies down the mountain without looking behind them, as then the genii of those regions approach; a like sacrifice takes place at the foot of the peak Hurtow.

When thinking over the religion of the Afars one can hardly be surprised, if the influence nature must have over the men is considered. Look at this country, with its Salt Plain covered with vapour, surrounded by volcanic hills, which never cease to menace men with their burning tempests and "fata morgana," it is only natural that the bad spirits should have as much respect paid to them as the good, and be equally adored here, as they are amid the snows of Siberia.

A few observations on the manner of burying the dead. What a contrast! The living have such bad houses—the dead have such fine graves. The tomb is a vertical shaft, which at the bottom joins a horizontal shaft, like an oven, the mouth of which is closed by a stone on the body being deposited in it. The vertical shaft is then filled up, and the place is indicated by a great heap of stones, encircled by a wall. If the deceased has been killed, the heap is made conically. Rarely we saw square tombs, with very rude masonry.

The great care the Afars and nearly all the people of Northern Abyssinia take in burying is, I believe, not a consequence of their belief in the simple immortality of the Monotheists—Christians and Mussulmans of Abyssinia pile up the grave just over the body—but is justified by the old belief in a subterranean second life, of which vestiges are yet to be found all over the Abyssinian frontiers, even where Christianity and Mohamedanism have long since been introduced.

We must say a few more words on the character and spirit of the Afars. That which surprised us most with these people was their loquaciousness, and their greed for news, which is, perhaps, only another form of the same: they live a long way from one another; their visits to each other are very frequent, and merely to exchange news.

We need hardly speak of the eloquence of the Afars—it oppresses a stranger; but I see by it the people understand that persuasion is better than force. More civilized people have not yet arrived at this. Another thing is, the Afars never interrupt a conversation; in which they again differ from more civilised people.

From what I have seen, I should say that the intelligence of the Afars was very mediocre, although they are not wanting in animal instincts. The Afars have many bad qualities: they are very avaricious, liars, obstinate, and cruel. The slightest dispute provokes blows with the knife; murder is honourable. The Afars, like the Gallas, mutilate those they kill, and wear the trophy.

They have also some fine qualities: one is the respect they pay to old age, and that is not such a common quality with wild people as might be supposed: another is the profound disgust they have for stealing; this crime is, therefore, unknown here—an extraordinary virtue for such avaricious people. I have met with a good deal of wickedness and falseness, but have also met here and there very faithful and amiable people, which makes me hope that most are not bad. We do not know enough, in any case, to judge of the characters of the Afars; but we know enough of their lives to pronounce that in the whole of barbarous Africa there is not a race more barbarous than the Afars, and the chief reason is, I believe, their isolation from the rest of the world.

XIII.—THE INHABITANTS OF DOGA.

The foregoing observations entirely concern the Afars of the Lowlands. The Dogas deserve mention on account of their peculiarly exceptional character. It is very probable that Doga was before inhabited by Christians; the tradition even now says that they had a market close to Maglalla, and that the Christians therefore extended there. What nearly settles the question is that all the Doga names are derived from the Abyssinian language. They gradually retired before the Afars, who aided commerce by employing camels, that being the cheaper means of transport; they put the whole caravan-route from the Salt Plain to the foot of the Abyssinian hills under the care of the same people; it is, therefore, the salt commerce which produced the colonies of Afar and Doga, and which by its nature compelled them to abandon their nomadic lives and occupy themselves little with herd breeding.

If we take the line from south to north we find the following salt markets:—

Country.	Place.	Tribe.	Chief.	Market-day.
Ala	Hadar Kussra	Dumhoita	Hodeli	Saturday.
Ayba	Au	Dahimela	Weld Shéko	Monday, Thursday.
Efisso	Efisso	Dahimela	Johannis	Monday.
Kablagubbi		Belessua	Weld Dardar	Saturday.
Géf		Haso	Ditto	Ditto.

These five markets are situated close to one another, at the foot of the principal Abyssinian chain, on a space which is divided by low watersheds into many valleys, and which communicate easily one with the other. The two last markets correspond with Agamé, at a rapid slope, while the three others correspond with the plateau of Atsbi, at a descent easy and perfectly accessible to a camel. I calculate the number of men as 500 for No. 1, 700 for Nos. 2 and 3, and 400 for No. 8. The Hasos are not Afars; that would give a population of from 6000 to 7000 souls. The Dahimela are the strongest; the most powerful chief among them is the Chief Weled Cheko, who does all he can to harm the Dumhoita market. Notwithstanding their close neighbourhood, the Dumhoita and the Dahimela are enemies and rivals; now they tolerate each other, but are not pacified, while the Belessua are friendly with all. Each market forms a city, where the dispersed natives of the tribes meet on the market-day—no one remains away. The next day all who are occupied in transporting salt descend into the plain, and only return the night before the market-day. The salt-caravans make their journey without any precautions against the dangers they may and will most certainly encounter. They take neither chief nor escort; they don't even go together, one caravan often covers a long line of road. Each part of the caravan is often separated by many miles; it is, therefore, not astonishing that brigands in small numbers, badly armed, succeed almost always in carrying off part of the caravan.

The salt is carried by camels, mules, asses, and porters. The beasts of burden have not regular saddles; for these are substituted two triangles of wood, which they place on either side of the back, so that one side of the triangle is attached to the side of the corresponding triangle, while the two other ends are fastened with ropes which pass under the belly of the camel, and it is along these triangles that the pieces of salt, well tied with ropes, are placed. A camel carries 500 pieces, a mule 250, an ass 200, and a man 60 to 100. On leaving the market they always overload the animals, and if they drop from fatigue on the road they throw away the extra load.

The salt sold at the market is often taken away by the Abyssinians, who have beasts of burden: if they have not, the Afars let out their camels and mules, and carry the salt as far as Enderta.

Some Abyssinians travel with the Mussulman caravans; it is very rarely that Christian caravans visit the Salt Plains; the men of Doga are, therefore, fully occupied with this commerce, and have not time to think of cultivation, for which the country is not favourable either, and they seldom trouble themselves about their herds of cows, which generally graze on the Doda lands. I will add a rough estimate of the extent of the salt trade:—

Weekly Charges of the Markets.

Mean charge, pieces of salt, 250.	No. 1	700	3000 × 250 = 750,000.
	Nos. 2 and 3 ..	1500	
	No. 4	800	

Make weekly 750,000 pieces, in forty working weeks 30,000,000 pieces. The price to-day being twenty for 1 dollar, a value results of 1,500,000 dollars a year.* The least weight of each piece is 1 lb.

The camels which carry the salt earn 25 dollars in a single journey, but the road is fatiguing, living expensive, and there is a great deal of risk. It is not probable that the salt will hold to this price. There are some years when you can buy from 100 to 300 pieces for 1 dollar. It is difficult to explain the cause of the great rise and fall in the price of salt. Must we look for the cause in the demand of the consumer? No; because Abyssinia buys less salt than formerly. Is it owing to war? Most certainly not; because communication interrupted would stop the demand on the market. Then whence comes the rise? I would suggest that the demand increases as consumption decreases, to obviate the great want of small change which they feel in Abyssinia the more dollars disappear, poverty necessitating retail trade.

There are custom-houses established at the markets in favour of the chief of the market, who shares his gains with his parents. The duty is about 2 per cent. on the quantity. One exception is made at Efisso, where there is an Abyssinian custom-house, owned by the Chief of Wonberta. The three markets to the south are under the masters of the Wonberta and Enderta; the two others are under the Chief of Agamé. They pay tribute, but without any fixed rule; when we arrived at Hodeli's place, Cassai asked him for 500 dollars; Hodeli, to raise this, charged each salt-merchant a tax of 1 dollar; the duty is here exorbitant, but from the continual changes in Abyssinia it often happens that in the same year the duty has to be paid to two Chiefs.

The Doga, on account of their friendly relations with their neighbours and masters the Abyssinians, like the people of the Tigré, speak the same language. The Dumhoita live always in tents, while the Dahimela have conical huts like the Abyssinians. The west part of Abyssinia takes its salt from here; all Amara, Godjam, the Gallas, all Tigré, with the exception of Hamazen and Akulo Guzay, who find it is cheaper at Massowa. The south of Abyssinia (Shoa), Wolo, and Asubo take it from the plain of Aussa. We have already said that salt is a merchandise which serves for small change. If it were possible some day to replace this heavy money with something more reasonable, the price would fall, and Abyssinia would get on better.

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* The mean value being 100 pieces, that makes 300,000 dollars, = 60,000*l.* mean value.

XIV.—RETURN JOURNEY.

On the 25th June, the last day of our stay at Ala, an affair happened which was not then explained, and which caused me great anxiety.

My men were invited the evening before by the people inhabiting a village 2 miles from us; they all returned in good time, having been most hospitably received and well treated. My Abyssinian servant returned with them, but under the pretext that he had lost part of my sword, which I had confided to his care, he returned alone without giving me notice of his intention. As he did not come back, I, towards noon, spoke to my host, and he started in search of him, but in an hour returned and said, "Your servant has been deceiving you. He is with his own countrymen in another village, but I have given an order for him to be brought here." An hour after, the nephew of the Chief arrived with the news that they could not find the man, and that it was most probable he was already *en route* for Abyssinia. I would not believe this, and thought the men were quite capable of murdering him, but they would hardly do it in broad daylight, on a frequented road: nor is it likely the man would desert me for the sake of stealing the sword; he would have more to gain by remaining with me, and he knew it. There was only one conclusion to arrive at; that, having heard me make inquiries about the road and country, he thought I had hostile intentions against Abyssinia, so would make himself useful to Dedjus Cassai by telling him of it, and causing me to be taken prisoner.*

This supposition, which was more than likely, made me very uneasy; we were too close to the Cassai's camp to wait for further news, so we started at half-past seven in the evening. Hodeli having advised us to leave at night, to conceal the direction we were going from our enemies. We said good-bye to our kind host, who had done all in his power to make our stay with him agreeable.

Hodeli's son and nephew, with ten men, escorted us as far as Edelo, where we arrived the next morning (26th June). In the afternoon we continued our route alone, and we arrived after sunset at Maglalla; on the morning of the 27th we descended the River Sabba, and passed, close to Maglalla, the Efisso caravan, which was going to the Salt Plain.

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* I heard since that the man had really escaped, and was killed by a Galla, who took my sword and went to Doda; but Hodeli sent for it, and I received it in October at Massowa.

Arriving at the bottom of the torrent, we suddenly came on another caravan, which was encamped along the river. These people took us in their first surprise for Abyssinians or Belessuas; every one jumped up—there were at least 200. We waited in the middle of the torrent with our guns raised ready for battle, when happily there were some men among them who recognised us, and tried to quiet the others, who were blinded by fear or excitement. We found out at last that the caravan belonged to Hodeli; thus, instead of enemies, we found friends, who were very sorry to have shown any hostile intentions. They begged us to encamp with them, but we placed ourselves under the shade of rocks or trees. The caravan came in a body to make their excuses, and present us with fifty loaves of wheaten bread, five for each of us. We were to have gone on with the caravan as far as the plain where our roads separated; but our animals were not loaded soon enough, and the caravan departed. At the moment we were starting the Johannis' caravan, which we had left behind, came up. We were in the torrent, which was not wider than 100 paces, so surrounded that we could not retire: to stop was to show our fear; so on we went together, although we heard many words indicating hostile feeling. So with our fingers on the triggers of our guns, we descended the rest of the torrent, which was not at all an advantageous position for a battle in which we were as 1 to 20, but we were decided to sell our lives as dearly as possible. When we gained the open ground, we felt more at our ease. We were few in number, but had guns, two shots of which would have driven most of them away. We found in the plain which lies over the Sabba twenty more awaiting us. We passed close to them, hearing their conversation; some were quite ready to attack us, others thought differently, and they said one to the other that we should not be passing so quietly if we did not feel stronger than they were. This storm therefore passed without bursting, and in a few moments our roads separated; the caravan was going to Asali, while we were looking for a road to the north along the Salt Plain.

I shall most likely be asked what we had done to this caravan to make the people so bitter against us. In this country every stranger is an enemy worth killing. We came from Hodeli's market; he had become our host and protector; we had not had leisure to make friends also with the Dahimela Chiefs, we were therefore their natural enemies as long as we showed a preference for Hodeli. I must not forget to mention that Asa Mahomed deserted us at Sabba. He could not but see the danger which threatened us, but thought he had served us long enough; his *finale* therefore was not more honourable than his *debût*. Nakhoda, on the contrary, only left when we were free from all danger. We slept close to the salt pit, a little to the north, where there were a few trees and coarse grass, our animals had thus a good feed; but we had to be up all night to protect them against very large hyenas; the donkeys often drove them victoriously away themselves.

From that we followed for three days the western side of the salt basin, which is skirted by a chain of mountains about 1000 feet high, showing here and there ravines made by the torrents. Between these and the Salt Plain extends, along their whole length, a plain with a considerable slope formed of a chaos of volcanic stones, which had probably been detached by the water from the mountains. The basin itself is in a marshy state here.

The morning of the 28th June we walked a long time without going far; we were to stop at the Beliga water, which lies in the chain. There was no longer any road; after following for some time the edge of the basin, we diverged towards the first hill of the chain. We followed for some time a torrent which to our surprise we found made a second bed in the clayey earth to the depth of from 200 to 300 feet; we descended into this precipitous ravine: the sides undermined by the water presented a peculiar appearance—towers, walls, and peaks without any support; we were astonished the sound of our footsteps did not bring them down. This deep channel conducted to another large torrent, where we found shade in a grotto formed of soft lava, pieces of which we could break off with our fingers. All this part of the chain is formed of gypsum, mixed with lava of more or less solidity, which crosses the gypsum like veins in the human body.

In the evening we again came on the sloping plain, covered with stones, and encamped opposite to Dellol, in the Salt Plain itself, where the torrent has raised the level a little, depositing sand which is covered with grass. We found here some Woyta and Gedal salt-diggers, living under the rocks. We perceived to the north a mountain peak, Mará (which signifies "not to be attained"), this guided us on our route.

On the 29th of June we continued our course of the previous day, burying ourselves very soon in the mountains, where we found almost running water. Here there are a few Belessua workers in salt. The men and women came to see us, all very good-looking. The air seems to preserve the skin. We passed the day here, as we should find no water till we got to the Raguali, nearly 20 miles from this, which requires at least ten hours' from the bad road. We made this march in the night and morning of the 30th of June; we kept along the Salt

Plain, which is close to the mountains, and touches the promontories. We had to go round one cape after another, and really it was just as bad as doubling the capes in a boat with a contrary wind; we often tried to shorten the road by taking the line to the right, which leads from one to the other across the Salt Plain, but we hardly made two steps before our animals sunk in, and we had great difficulty in getting them out. Then again we gained the border, and started across a terrace so covered with stones that we hardly knew where to place our feet; everything was against us—no moon, and a stifling wind in our faces.

We walked thus the greater part of the night; on the morning of the 30th we found ourselves close to Mará. The salt basin here changes its character. It is divided by a long strip of land covered with trees, tamarisk, and hotam (soda-tree), which extend a good deal to the south. We soon entered it and found a large torrent called Raguali; bordered on the east by a dry canal, perfectly straight and hidden amongst the trees, the bed covered with luxuriant verdure. As the guides did not know exactly where the water was, we encamped on the edge of the canal. It being impossible that all this green grass could have grown without water, I made them dig, and at a depth of 3 feet we found an abundant supply of fresh soft water. We passed the day here, lying on the grass, resting our eyes after the monotonous grey and white of the Salt Plain.

There is a village of the Belessua here, whose Chief, Abdulla Féré, came to see us in the afternoon, and begged us in a most courteous way not to leave without partaking of his hospitality. He took us across a perfect forest of hotema,* by a zigzag path almost covered with branches which had grown across it, to his village. We came out on a lawn on the banks of a canal of running water, 10 feet wide and 1½ foot deep; the village only consists of 20 huts, but round about are several hamlets belonging to the Belessua of the Alleyta division. We were very much surprised to find in the middle of the Salt Plain, and on the same level, such an oasis—most fertile soil, magnificent Abyssinian grass (Serdit) in abundance, a veritable running-water canal. This miracle is effected by the Raguali River, which, rising in the centre of Agamé, makes a breach in the mountains, and sends its abundant waters from the high country into the Salt Plain. The Abyssinians call it Awra; it is the only river which turns from Abyssinia to the east and runs into the Salt Plain. Sometimes during the years when the river runs with great force, it brings down a considerable quantity of sand, and so interferes with the richness of the soil;

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* Soda-tree (Arab. Eshnan).

this might be easily regulated. There is no country better adapted for the produce of cotton, but it is impossible the Belessua can turn their minds to cultivation, harassed as they are by their enemies, who force them to leave and change their habitations very often. Abdulla Féré brought us in the morning plenty of milk, and two sheep. What struck me most here was the absence of all ostentation. He begged us to spend the next day with him. He quite appreciated the beauty of his country, and enumerated complaisantly all the beautiful places he possessed along the river. He told me he would willingly give up all, to be saved from the brigandage of the Hasos and Abyssinians. He said the Turkish Government has been of no benefit to him so far.

On the 2nd July we left the village. We first crossed a forest in which were concealed several Belessua villages, and at last we found ourselves for the last time on the Salt Plain, naked and grey, with large stones and pumice thrown here and there, bordered by a chain of hills of gypsum mixed with lava. We saw many ostriches grazing.

We found on the outskirts a little drinkable water, a few palms and miserable acacias. At noon, leaving the plain, we commenced ascending the chain in front of us, which proved to be a series of terraces consisting at the bottom of gypsum. There are a number of small extinct volcanoes, which have thrown their lava on and covered the soil with black stones. Passing the ridge of this chain, which is barren and desert, with the exception of some small low grounds, between the terraces covered with acacias and inhabited by wild asses, of which we saw many tracks forming regular roads, we descended into a large plain (Addado) which forms a kind of valley between the gypsum chain and the hills which run parallel with the sea. The waters uniting in a torrent run to the coast of at Howakel Bay. The ground is sandy, rich in grass, and in some parts covered with shells.

We abandoned this torrent on the morning of the 3rd July. Having passed another small volcanic range, we went down into another valley, where we found some wells, bordered by fine palms and immense acacias, named after the people who had them dug, Kuntubba-Ela (well of Kunt). Water is to be found at 15 feet; it is sweet. We found here a small Belessua village, the people of which brought us some goats as a present. From here, to arrive at the coast, from which on our right the hills divided us, we had to pass over whole heaps of stones, which beat all we had walked over yet. The morning of the 4th July we descended into the large plain of Arena, which, between the sea and the volcanic hills, extends as far as Buri.

We encamped at a well named Geréra, with water at 15 feet, which is sweet but gives colic. The plain is covered with grass, and fine Sayal acacia. We were 2 miles from the sea at Arena. Before us extended the peninsula of Buri, bordered on the south and south-west by a chaos of hills, consisting of piles of stones, which continue as far as Annesley Bay. We had at first intended to have gone to Massowa by sea, but a strong wish to visit Buri and Annesley Bay made me change my mind.

We received a visit from the young Chief of Aréna, Mohammed Anbesh; he brought us a sheep and rice, and invited us to come to his village. But having a guide from Raguali with us, who had formerly killed a native of Aréna, I was unwilling to insult people by bringing him into their village, and so decided to pass the night outside. The man himself I sent in the night safely back to his tribe.

We started only on the evening of the 5th; we crossed the peninsula of Buri in a north-west direction. We passed the night in the plain of Bardoly, and on the following morning we entered soon the low hill range, which separates Buri from Annesley Bay, and leads down to the sea at Missé, leaving the small salt plain to the right.

After the scenery of the Salt Plain we duly admired the plains of Buri: a fine level road, all the country covered with luxurious, even green grass, and beautiful forest (wells in many places with abundant water), and enlivened by an immense number of flocks and many settlements of Dumhoita, who received us exceedingly well and gave us plenty of milk. The people are much better dressed than elsewhere, and men and women exceedingly well made.

From Missé, where there are wells, we followed the shore for 2 miles further, and camped at Addoor, between overhanging rocks near the shore, where many fine grassy plains interpose themselves between the sea and the hills accompanying the shore-line. We found water very near the surface, but it is said to become bitter in autumn. The plains and the hills hereabout are inhabited by Belessua.

From Addoor we followed the sea-shore to Arafali at the bottom of the bay, where we arrived only on the following morning, on account of the hills approaching the sea so closely as to oblige us several times to wade through the water or to look after a passage over the overhanging rocks.

We were received at Arafali by the chief of the Egyptian post, which has been settled here to protect the country and to receive a small duty on the salt, which the natives bring from Buri and sell to the Abyssinians, the amount of which is 120 dollars a month. The soldiers have dug many wells with sweet water and made some little gardens.

We left Arafali the following morning, passed the day at Zulla, and on the following morning, on the 9th of July, we arrived at Ras Gherar, opposite Massowa, after just a month's absence.

OBSERVATIONS made on the JOURNEY through the AFAR COUNTRY.

No.	Name of Place.	Date.	Time.	C. Thermometer.	Aneroid Barometer.
1	Amphilla Village	1867. June 11	A.M. 8·	° 32· c.	° 29·76
2	Fridello	,, 12	,, 7·30	31·5	29·61
3	,, ...	,, ,,	P.M. 1·	41·	.. ..
4	,, ...	,, 13	A.M. 7·	31·	29·55
5	,, ...	,, 14	,, 7·	32·7	29·53
6	,, ...	,, ,,	P.M. 3·	40·	29·45
7	Sugo	,, 15	,, 9·	32·	29·07
8	,, ...	,, 16	A.M. 7·	31·3	29·16
9	,, ...	,, ,,	,, 11·	31·5	29·16
10	Height Didik	,, ,,	P.M. 8·	33·	28·4
11	Camp Ales	,, ,,	,, 9·30	.. ..	28·55
12	,, ...	,, 17	A.M. 5·	.. ..	28·55
13	Camp Ramud	,, ,,	,, 9·	39·	29·10
14	,, ...	,, ,,	12·	41·	29·07
15	,, ...	,, ,,	P.M. 1·	43·5	29·
16	Camp near Woraris ..	,, ,,	,, 8·	33·	29·6
17	Camp Kottahari	,, 18	A.M. 7·	36·5	29·99
18	,, ...	,, ,,	,, 9·	37·	30·80
19	,, ...	,, ,,	P.M. 2·	47·	29 85
20	Camp Asali	,, 19	A.M. 2·	.. ..	30·20
21	Camp Handeda	,, ,,	P.M. 2·	43·5	29·50
22	Camp Sabba	,, ,,	,, 9·	.. ..	29·15
23	,, ...	,, 20	A.M. 6·	.. ..	29·14
24	Camp Upper Sabba ..	,, ,,	,, 9·30	40·	28·60
25	,, ,, ..	,, ,,	P.M. 4·	44·5	28·43
26	Lemalé	,, ,,	,, 6·30	37·	27·85
27	,, ...	,, ,,	,, 9·30	33·	.. ..
28	Edelo	,, 21	A.M. 2·	.. ..	26·90
29	,, ...	,, ,,	,, 8·	35 5	26·87
30	,, ...	,, ,,	P.M. 3·	38·	26·80
31	Hadar Cussra	,, 22	A.M. 7·	31·	25·80
32	,, ...	,, 23	,, 7·	33·	25·72
33	,, ...	,, 24	,, 7·	28·	25·75
34	,, ...	,, ,,	,, 12·8	34·	25·67
35	,, ...	,, 25	,, 7·	28·	25·8
36	Edelo	,, 26	,, 10·	30·	26·77
37	Night after Edelo ..	,, 27	,, 6·	27·	28·25
38	Sabba	,, ,,	P.M. 3·	38·	28·95
39	Camp up Sabba	,, ,,	,, 6·	41·	29·4
40	Beliga	,, 28	A.M. 10·	43·5	29·54
41	Camp vis-à-vis Dellot ..	,, 29	,, 5·	41·	29·37
42	Camp Night	,, ,,	.. ..	.. ..	30·
43	Raguali	,, 30	,, 11·	35·	30·
44	Camp Raguali	July 1	,, 6·	30·	30·
45	,, ...	,, ,,	P.M. 4·	41·5	29·87
46	,, ...	,, ,,	,, 6·30	37·5	29·90
47	,, ...	,, 2	A.M. 6·	31·5	29·96
48	End Salt Plain	,, ,,	,, 9·30	29·5	29·95
49	,, ...	,, ,,	P.M. 2·	45·5	29·83
50	Vulcan	,, ,,	,, 5·	39·	29·37

Observations made on the JOURNEY through the AFAR COUNTRY—*continued.*

No.	Name of Place.	Date.	Time.	C. Thermometer.	Aneroid Barometer.
				°	°
51	Plain near it	,, ,,	,, 5·30	.. ..	29·43
52	,, beneath it	,, ,,	,, 6·30	38·	29·50
53	Addado	,, 3	A.M. 5·	31·5	29·57
54	Kuntubba	,, ,,	,, 10·	37·	29·43
55	,, ...	,, ,,	P.M. 2·	40·	29·33
56	Gerera	,, 4	A.M. 10·	44·	29·55
	,, ...	,, ,,	P.M. 2·	40·5	29·44
	Thermometer broken.				
	Ele Barha .. .. .. (Arkiko.)	,, 9	....	....	29·60

NOTE.—The thermometer in degrees of Celsius. The barometer a pocket aneroid by Pastorelli.

Itineraries.	Miles.	*Directions.*
June		
10.—Amphilla Pass to Village ..	4	Amphilla Village, Fridello Hill, s.s.w.
11.—Vill. Fridello	8	
15.—Fridello, Beheyto Well ..	4	
Fridello; Sugo	8—10	Sugo. Amphilla, 31; Fridello, 33; our probable way before us, 230; Didik, s.w.
16 P.M.—Sugo, Ales.		
4—5. Torrent.		
1—2. Plain and ascent to Didik.		
3—4. Camp Ales ..	8—11	
17 A.M.—Ales, Ramud	..	About w.s.w.
4—5. Torrent Ales, narrow.		
1. Torrent Ales, large.		
1—2. Open plain ..	6— 8	
17 P.M.—End Woraris	..	About s.w.
2—3. Torrent Ramud.		
2—3. Plain over torrent.		
1½. Side of the torrent.		
4. Torrent to camp	9½-11½	
18 A.M.—To Kottahari	..	About s.w., w.s.w.
5—6. To beginning of Basin	..	*Dis.* From Kottahari.
2—3. Basin to the Palms	7— 9	To Woraris, 50; but great turn to s.
18 P.M.—To hill Asali	13—15	Dellot, 270; Asali, 240.
19 A.M.—To end Basin	4— 5	
To torrent Handeda	2	From Handeda—Asali, 100.
19 P.M.—To under Sabba ..	4— 6	Road before us, 260.
20 A.M.—Torrent Sabba, to ..	..	Upper Sabba—Maglalla.
Camp Upper Sabba ..	7	Maglalla to Imba s.w.

Itineraries.	Miles.	*Directions.*
June		
20 P.M.—To Lemalé.		
1½—2. Upper Sabba, Maglalla Reunion.		
2. End Imba defile.		
2—3. Plain Malharez	..	Imba—Malharez, S.W.
2—2½. Over hill to Lemalé	7½— 9½	Lemalé S.W., and then S.
20 P.M. and 21 P.M. } To Edelo	..	Dis. S.
3. Torrent.		
2—3. On its side.		
5—6. Open country	10—12	Dis. to Desso W., and so about.
21 P.M.—To Ala	..	Ala.
12. Actual march winding		
5½. To Saddle Galara	..	S. for 3 miles, then W.N.W.
2. To torrent Buri	..	S.W.
4½. To market	..	
Direct only	7— 8	
RETURNING ROAD.		
27. —Camp near Salt Plain, about	..	
5 m. from Sabba, W. from Salt Plain	..	Dis. Artali, S.E., 5 S.
28 A.M.—Beliga	..	Sabba, S.W. 5 S.
4 h. march, only	3— 8	Route forward, N. 10 E.
27 P.M.—Camp vis-à-vis Dellol	5— 6	Here *Mara* h., exact N.
29 —To Promontory	2	Dis., road N. 10 W.
To Camp behind in torrent	1	Asali, 130; Artali, 145; Dellot, 4 miles.
29 P.M.—To torrent Lemalé	3	Off 90—70.
Night march, and 30 A.M.—To Raguali	20	*Dis.* Raguali Village; Mara, S.E. 4 miles off.
30 P.M.—To Village	2	
July		Arafali estimated, N. 5 W.
2 A.M.—To end Salt Plain	} 7	{ Buri is N. 10 E.
2 P.M.—To Addado Camp		Dis., road N.N.W. Mara, 170.
5—6. To small Volcano	..	Dis. Raguali, 200; Solli, N.W.
		To Village Raguali, 178.
6—0 To descent to Addado Plain	..	Dis. 48, after W. Solli, 3 miles off.
1—3. To Addado Camp	11—12	
3 A.M.—To Kuntubba Ela	7	W.N.W. Boka from hence E. 5 N. about.
4 P.M.—Mudino	5	Solli, 190. Salun, W. Route before N.N.W.
4 A.M.—To Gerera	8— 9	N. 10 W., after W. Sea 2 miles off; to Arena, N. 6 miles off.

Distance computed; watch stopped at Ala.

N.B. All the bearings and distances have only comparative value. Country and night-marches prevented sure bearings; bad road made difficult the evaluation of distances. To correct the map, take—

1. Amphilla, sure point.
2. Arafali, Narina, sure point.
3. Col. Merewether's and Col. Phayre's determination of Raguali.
4. Adsbi in Abyssinia, after the old maps.

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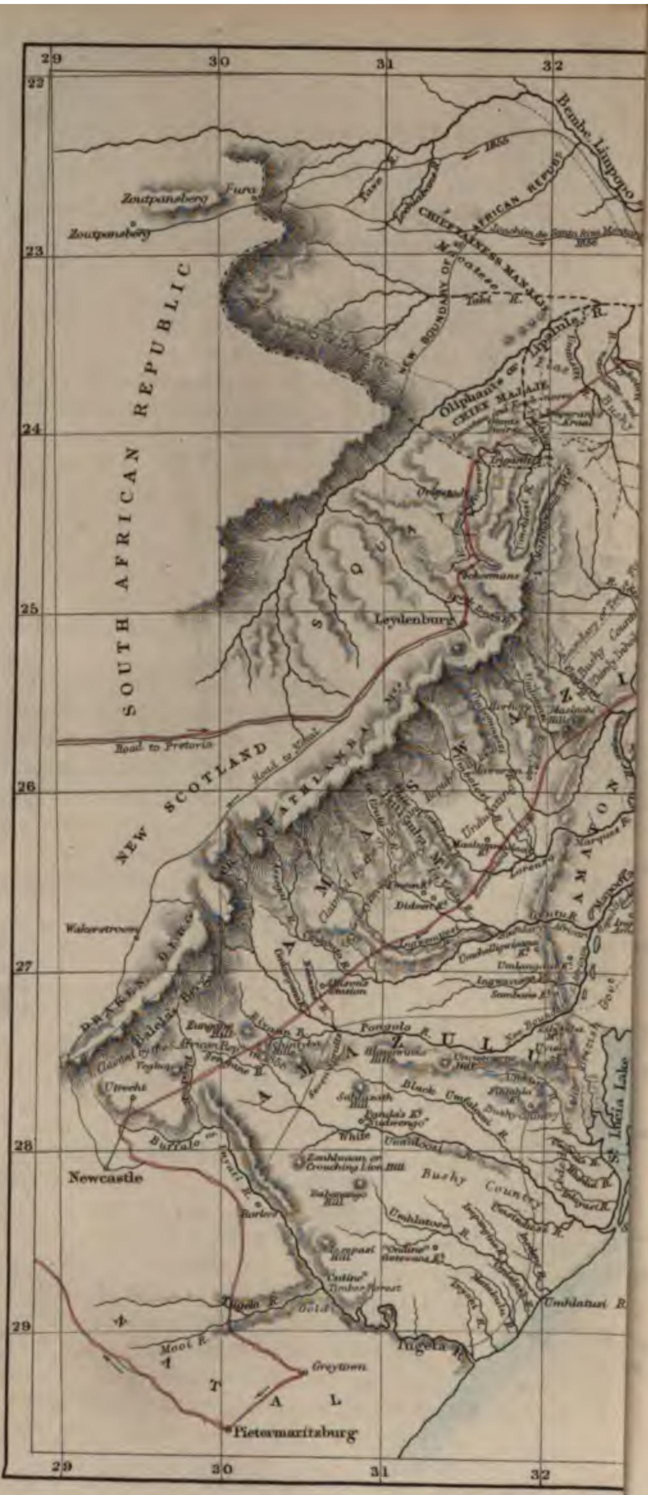

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XI.—*Journey of Exploration to the Mouth of the River Limpopo.*—By St. Vincent W. Erskine.

Read, June 14, 1869.

It was in the month of March, 1868, whilst serving some 100 miles from Pietermaritzburg, Natal, that I heard it was contemplated by Herr Mauch, the explorer, who was then there, to undertake a journey of exploration through the heart of Africa, from south to north. He was in want of a companion, and gladly accepted my proposal to accompany him. On reconsidering my plans, however, I came to the conclusion that it would not answer to desert my profession as Civil Servant of the Government, even in the pursuit of science or of fame; I therefore proposed only to accompany my friend as far as the Zambesi, and to return coastwise, exploring the Sabia and Limpopo rivers, &c., accomplishing as much in eighteen months (the extent of my leave) as I found practicable.

In pursuance of this plan, I left the city of Pietermaritzburg in a transport wagon bound for Potchefstroom, South African Republic, being unable to afford the hire of a wagon for myself, and thereby wasting a great deal of valuable time.

About the 6th May, 1868, "I got aboard," casting a lingering look at Pietermaritzburg from the surrounding heights, thinking of the mischiefs and mishaps, the perils and anxiety I should undergo before I again beheld those patches of red, blue, and black, peeping through the varied foliage.

After passing over some 120 miles of broken country, with high waving grass, and here and there a patch or two of Mimosa thorn, we ascended the Quathlamba, or Drakenbergen, and from the top looked down upon what seemed to be a flat country from that point of view, but which had appeared hilly and broken whilst ascending. This was the farewell look on Natal, the scene of many pleasant hours—a place where men grow "samples" derisively spoken of by its detractors, but where, nevertheless, some 100,000*l.* worth of sugar is annually exported seawards, and perhaps 10,000*l.* worth landwards; where also the growth of coffee already amounts to 200 or 300 tons per annum, and where the productions are such as are common both to the temperate and torrid zones.

On this range, or step, runs the boundary between the colony of Natal and the Orange Free State, a boundary made by nature as well as man, for on this high table-land, some 5000 feet above the sea, the topography and verdure seem to alter by common consent, the mountains taking most peculiar and fantastic shapes, and the grass changing from the rank luxuriance seen in Natal to the short thick grass of a colder clime. There the ant-bear no longer sets traps for the horseman by digging enormous holes fit to swallow a jackass; nor do abrupt hill and dale forbid long gallops after countless herds of antelope of every description, so famous in Natural History, which abound on these immense undulating plains, perishing miserably in thousands in the occasional snows that fall in winter, and whitening the ground with heaps of bones.

After passing along the ridge and crossing the Wilge River, a tributary of the Orange River, the traveller skirts a long range of table mountain, and reaches Harrismith, a district town in the Orange Free State, consisting of some 60 or 70 houses, and, I suppose, some 200 inhabitants.

On leaving Harrismith, you still continue passing over the rather dreary flats, generally burnt at this time of year, and again see numerous herds of game, now moderately fat. A few months later they will be reduced to skeletons, and many will die of starvation and scab combined; and especially of a very virulent form of scab called "fire sickness" by the Dutch; this sickness also affects cattle more especially on those farms where this species of game is plentiful. It is supposed to be incurable in both.

This is a good sheep country on the whole, but the sheep suffer from want of food in the winter, even when the grass is unburnt, as it has no sap or nourishment, and is like just so much tinder. Sheep that are constantly kept on it nevertheless thrive, and after a few years so improve the farm, that double, or even treble the number can run on it; and cattle also thrive exceedingly well, but are subject to various diseases—"lung sickness," "bush sickness," "geel sichte,"—and others, which considerably reduce the profits on this class of farming. The want of a good or reliable market is much felt. The average price of good trek oxen in the nearest market, Natal, is about 4*l.* per head. After travelling four or five days, I crossed the Vaal River (the boundary between the Orange Free State and the South African Republic), and soon afterwards arrived at Potchefstroom, the largest town in the Republic. The country alters slightly on approaching the town; the undulating flats give place to small heights forming precipitous and stony banks to the streams, and here and there patches of mimosa appear. The town contains about 1500 inhabitants, and is well watered and planted with trees. Good wheat is grown around the township, and yields from 16 to 27 bushels to the acre. This wheat is grown in winter by irrigation, and in a rich red soil, which is prevalent in the country. The site is in every way adapted for a large town. The surrounding country is slightly undulating, with a view of the Maluti Mountains, covered with snow, in the far distance to the eastward. Most luckily, I hit on an open wagon just starting for Pretoria. I engaged a seat in it, transferred my baggage, and started at once. This journey occupied four days. The aspect of the country altering but little, the short grass gives place to a longer and more luxuriant growth, indicating an increase of warmth. The peculiar and remarkable spots, such as Wonder Fontein, where there is a cave of unknown extent, have been so often described, that I shall not weary the reader with descriptions. The hills become bolder and more stony, until at last the road, passing through a gorge, brings into sight Pretoria, the capital of the South African Republic, and the high ranges of the Magalies Berg and Witte Waters Rand in the background, which give a more imposing aspect to the few neatly whitewashed houses of the town. It contains about 800 inhabitants, mostly English, and is perhaps the most enjoyable and fertile district of the Trans-Vaal. Though Leydenburg is generally supposed to be most fruitful, it is also slightly unhealthy; I therefore give Pretoria the preference as a residence. It is on the highway from Zoutpansburg to Natal, and has a large trade in ivory and ostrich feathers. The post arrives from the Cape and Natal once a week. Pretoria is not so well planted with trees (a great desideratum in South Africa), nor is it of so much commercial importance as Potchefstroom, but doubtless in the race of prosperity it will outstrip its elder and larger sister. A rather amusing incident occurred here, showing the difficulties with which infant communities have to contend in such small matters even as the supply of writing materials. The Government wished to make a fresh issue of notes ("Blue-backs"), but were unable to obtain a ream of paper on which to print them. Their difficulties, however, have not been diminished since the paper has been found.

A few words regarding this State by a disinterested observer may not be amiss. I think it has every prospect of a reasonable success; but, owing to its distance from the seaport, it will never become a great State, though its productions of wheat, sugar, and coffee, lead, copper, silver, gold, and magnetic ironstone, and its cattle and sheep, would seem to point out a path to prosperity, could the district be rendered more accessible.

If in possession of a strong government, a road or rail would be opened up from Leydenburg down the Drakenberg, passing along somewhere near the Umbolosi River, in the Amaswazi country, down to Delagoa Bay, and from Zoutpansburg, down the Limpopo to its mouth, where boats doubtless might land,

and ship cargo in vessels lying out in the open roadstead. The former route is about 120 miles long, and the latter about 200. I stayed about three weeks in Pretoria (luckily with a friend, Mr. Lys, for the hotel is not habitable).

I was then kindly given a lift to Leydenburg by Mr. Lys, and, after a rather uninteresting "trek" of about 100 miles, varied occasionally by a beautiful waterfall, we arrived there. The town consists of about 10 houses, and some 30 inhabitants. An affluent of the Oliphant's, or Lipalule River, runs past the town and is called Dorp, or Town, River.

As this place possessed no hotel, we thought we should have to rough it in the wagon, but Mr. MacLachlan, formerly of Natal, offered us accommodation in his house, and for this Mr. Lys and myself were extremely grateful—the more so as it was an unexpected and unsought kindness; which indeed he did not cease to manifest after I left for the Limpopo: but more of that hereafter. In my progress through this State I was in open, grassy country all the way; but to the north and west the country is entirely wooded with the usual mimosa thorn. I stayed for about a week at Leydenburg, during which time I employed myself in taking observations and deciding with Mauch as to our contemplated trip. After some discussion, I decided to go alone down the Limpopo, as the duration of my leave of absence would prevent my accompanying him to Moselekase (Motsilikatsi), and if I could complete that trip in about two months, I should have time enough to go up the Limpopo to Zoutpansburg, and thence northwards, returning by Inhambane; but, as the sequel shows, "Man proposes but God disposes." So that, after definitely settling the latitude and longitude of Leydenburg (31° 30′ E. and 25° 4′ S.), I made a start, getting a lift in Mr. MacLachlan's wagon to Trigardt's farm, about two and a half days' trek from Leydenburg. Soon after leaving I crossed the Speck Boom River, an affluent of the Dorp River, referred to before, and the same evening outspanned at "Schoeman's Farm," on the sources of the Elands or Umchlasingwana River; afterwards the road passes through a deep gorge along the course of the river, crossing it several times. This valley and the surrounding mountains are bushy. It has numerous farms on it, and though, I should think, extremely hot in summer, it produces good wheat. The stream passes through the deserted town of Origstadt, through which we also passed. It was deserted because of its unhealthiness, the inhabitants having moved to Leydenburg. After passing along this picturesque valley we arrived at "Trigardt's Farm" (latitude 24° 2′ S.). Being compelled to remain here until bearers could be sent for, I employed myself in shooting partridges and guinea-fowl. There are a few eland and koodoo, besides small bucks, on the mountains; but, having no horses, I only contemplated these precipices from afar. I made an effort to sketch this place, but unfortunately, being no draughtsman, failed signally, as the scenery is on that grand scale which requires a master hand to portray the varied shades of bushy hill and frowning precipice, coloured and tinted by shadows of fleeting clouds. After waiting a week or so, I managed to start, on the 13th July, 1868, having engaged eight Caffres besides the man Adam I brought from Natal. I engaged these for different articles; some I paid three stretches of blue calico, others 1 lb. of blue beads, others six rings of brass wire, to go to Umzeila's, the paramount Chief of the Bembe or Limpopo country, whose usual residence is at the confluence of the two rivers, Oliphant's or Lipalule, and Bembe or Limpopo. A Caffre will not willingly carry more than 30 lbs. besides his own mats, &c., although I was told he would carry 60 lbs. and made my packages accordingly; only 40 lb. packages should be made up; it is the utmost a Caffre will freely take, though he will load himself with meat to double that amount when he gets a chance. I have often heard it said that these natives eat immense quantities of either meat or maize, considering the work they do. I did not find it so, as my own appetite was quite equal to theirs, and I lived on the same description of food.

After passing along the Umchlasingwana or Elands River, above referred to, and ascending some heights of about 1000 ft., sleeping that night and the next on the veldt, we reached the top of the Drakenberg on the 15th. Three days' journey would not have occupied more than one, if we had not been delayed by rain.

From this height, some 2000 feet above the plain, the view, as far as the horizon, is apparently one uninterrupted flat, covered sparsely with bush, with the Umchlasi River flowing along like a silver thread in the depths below. To the left may be seen a small range of koppies or semi-isolated hills, apparently gradually diminishing in height until lost in the horizon. This range is reported to be on the other or north side of the Lipalule River, and I should say about 30 miles in a bee-line from the spot where I stood. The Umchlasi River could be seen, almost until it approached these hills, in a north-westerly direction. The descent is very precipitous, through a crack in the immense red cliffs, which is roughened by a friendly stream to give foothold to the traveller, and nourishment to a few trees which extend their friendly arms to hand him down the giant stairs. In one or two places it is necessary to drop some 6 feet. There are two other passes through these mountains; one is along the course of the Umchlasi River, but, owing to the difficulty of wading in water for about 4 miles, I took the above-mentioned one; the other is to the westward. After staying a few hours by the river, under a beautifully shady tree, I started for Imperani's Kraal, the first on the lower side of the Berg, and arrived there about seven in the evening. The country, as viewed from the heights, appears unusually flat, but, on descending the plain, it is found to be slightly undulating and sparsely bushed with different varieties of mimosa thorn and other similar trees. A stream, stagnant at this time of the year, passes the kraals. The water appeared bad and discoloured, but was not disagreeable to the taste. The surface-soil was coarse sand, the subsoil brown loam. Here and there rocks, composed of ironstone, crop out, and conglomerate. Several dry beds of streams were also crossed, all composed of coarse sand. I found food expensive here, owing to the failure of the crops at this season. Just at this point the natives are better off, but a little further back they are literally starving, and were most wretched objects to behold. Here I saw for the first time the so-called Knob-nosed Caffres. They mark their faces by pinching up the flesh in the shape of small knobs, about the size of peas, down the centre of the forehead and nose, and between the nostrils. The women have additional markings across the cheek-bones and along the upper lip. These people, as a tribe, are extinct, having amalgamated with the tribes of Manjaje and Umzeila. The rising generation are not marked. In a few years knob-noses will be as extinct as pig-tails.

The manners and customs of the Macatese, under Manjaje, are peculiar. This tribe is always governed by a chieftainess, who is not permitted to retain more than one child, and this must be a girl. Other children, when born, are destroyed. She does not marry, but chooses the fathers of her children indiscriminately from amongst her subjects, by whom she is held in great respect and reverence. Her territories extend from the south side of the Limpopo very nearly to its confluence with the Lipalule and along the former river to the Berg. Another Chief who owes allegiance to Umzeila, and is the master of this kraal, is called Manjaje, or Umjaje. His territory is undefinable. The tribe seems to be a constant prey to Umzeila, who destroys their gardens and impoverishes them in every way. They possess no cattle, or this Chief's visits would be more frequent. To give some idea of the value of food, I shall state what I paid for about one bushel of maize, namely, the value of about 10*d.*, for a fowl about 5*d.* in beads, or blue salempore (calico).

I find it an awful business to get under way. Up at 6 A.M., I have to see the Caffres cook their food myself; altogether it is three hours before they start, after being stirred up. I find myself stiff from the day-before-yesterday's hard work in descending the mountain. Here I saw the first "Tsetse fly," which answered exactly to that described by Chapman, very like the ordinary dark-grey horse-fly, not quite so large, with a long game appearance, barred across the abdomen with blackish stripes, the colour between which is lighter than the rest of the body; the wings, when closed, lay along the body, overlapping each other.

I saw some quaggas to-day, or rather Bonte quaggas, or zebras. A cool breeze from the E.S.E. I hired another bearer to carry food, as I should not pass near any kraals for some days. The Caffres have a few miserable cur dogs, which are not affected by the "fly:" they resemble jackalls, and are generally of a light-brown colour, with curled-up bushy tails; their coat is rather long and hairy. I find I get very tired towards the end of the day about the legs; but I suppose this will wear off with use.

I crossed what would be a river in summer, but what at present is a succession of pools, some two or three miles apart: water is to be had by digging a foot or so. A traveller, not knowing this, might come across such water and see only a waste of dazzling white sand, and perhaps perish for want of that which was a few inches under his feet. The country is of the same unvarying flatness, covered with seedy-looking "bush." The soil appears of much the same description—very poor, I should think. There are more outcroppings of rock than I have hitherto met with, mostly sandstone and conglomerate, sometimes quartz.

Passed the "Umtasiti" or "Umtaseera" River, the only running stream encountered since crossing the Umchlasi River. It is a fine stream, as clear as crystal, flowing over a sandy bed. On the northern side I found a reef of quartz, of a beautiful white colour, evidently of the same description as that in which Herr Mauch discovered gold on the "Shashi" River. I broke off several pieces, but in none of them was there visible to the naked eye any description of metal. The "bush" here is not large, principally mimosa of different kinds; some thornless trees may also be seen here and there. The bush is sufficiently thick to impede the view, but a horse could be ridden at full gallop through any part by avoiding the clumps. This bush is the huntsman's friend, affording him concealment in stalking his game, which otherwise would be difficult to procure, as you cannot hunt on horseback on account of the "fly;" and I may here remark that, to my mind, this destroys almost all the pleasure of sport. I would rather shoot a little ordinary game, such as hartebeeste, wildebeeste, and blesbok, mounted, than a large quantity of big game, such as elephants, rhinoceros, sea-cow, giraffe, buffalo, &c., on foot.

I was generally somewhat in front of the bearers. On one occasion I passed a rather peculiar-looking dead stump, or very large ant-heap; being anxious to get to water that night I did not trouble myself much to examine it, but soon after passing it one of my Caffres came up and said, "Shoot, shoot!" pointing out this stump. I said it was only a stump, not lifting my eyes higher than the tops of the small trees, on account of the glare from the sun; but at that moment it seemed to move, and on looking upwards I caught the mild black eye of an enormous giraffe. My heart was in my mouth, I could not cock my gun fast enough; I threw it up and gave the animal the 10-bullet, backed by 6 drachms of powder, expecting a mighty downfall; but my first giraffe was not to be killed on this occasion. Water being far off, he was not followed. I saw a good many impalas and a variety of bush-pig, new to me. Those I have hitherto known are of two varieties—the "Vlat Vark" or "Flatt Wart hog," and the "Bush Vark" or "Bush pig," with grey bristles on the back. This little creature, about the size of a good half-grown domestic pig, was blue, and had few bristles on it. The country from here to the Sorgobiti River swarms with game, consisting of giraffe, eland, buffalo, koodoo, zebra, brindled gnu, zenondo or bustard, hartebeeste, pigs, and other kinds; I also saw here a large black pheasant or koran (*Florican*), of a species I had never heard of or seen before. I saw a great deal of game, but it was wild, and I was tired and did not shoot much.

On coming to the Sorgobiti River the Caffres proposed that I should stop, though it was then only about 12 o'clock, on account of absence of water ahead. I had been so often deceived by this same cry, and knowing what liars they one and all are, I was inclined to push on; but seeing numerous buffalo and other spoor, I stayed for a day's shooting. About 2 o'clock P.M. I went on the spoor of some buffalo; but the men pointed out some 600 yards away the "dead tree" appearance of a giraffe, head and neck far above the bush. We deserted the buffalo spoor for the giraffe. After a good deal of stalking I got within 86 yards (afterwards measured) and fired. The Caffres cried, "He is hit!" I gave him the second barrel and followed the Caffres at full speed, charging my breech-loader on the run. Having gone about 500 or 600 yards I was blown, and stopped; but hearing the Caffres shout "He stands, he stands!" I ran on again and fired a shot ingeniously into a thick tree. Ran again some 600 or 700 yards, till I was blown. The Caffres again shouted "Come on, come on; he stands!" I walked this time and gave him another shot, loaded, and ran again. I stopped, being unable to keep the quarry in view. The Caffre ran back, seized my gun, and said, "Run, run!" I did run in a sort of way, and at last espied the giraffe standing with his rump towards me, and gazing with his moist black eyes over his shoulder. My conscience gave a twinge at killing such an animal; but bang went the "10" and down he toppled, making the ground tremble beneath my feet. I gazed with delight, mingled with pity, at my first giraffe, and almost registered a vow that I would never kill another. The noble creature was 11 feet 3 inches from the top of his tail to the point of his shoulder, 11 feet 3 inches from the toe of his fore-foot to the top of his wither, 16 feet 5 inches from the toe of his fore-foot to the top of his horns; the length of his neck, from the top of his shoulder, was 7 feet 9½ inches; extreme length, from the tip of his tail to the tip of his nose, 19 feet: his head was about 3 feet long. I went out the next day and tried for buffaloes, but was unsuccessful, though the spoor was fresh. I saw many giraffe, partridges, and pheasants. When game is killed, it is difficult to induce Caffres to leave the meat; I therefore determined that, as I had neither time nor goods to waste, I would shoot no more, and seldom went out after this, although I saw much game, including sea-cows, in both the Lipalule and Limpopo rivers.

The natives about here suffer from drought, and would frequently starve were it not for bountiful Nature, which gives them the "Temongo," a red fruit, the size of a small apricot, growing on a large tree of the Caffre fig species; the stone of which, on being broken, shows two kernels of about three-quarters of an inch long and one-eighth thick; they have little taste, but are very oily and good eating. The natives also procure the fruit of another tree, and pound it up in wooden mortars. It then has the appearance of dry pounded dates, and is called "Te-hawkwa," and has a sweet and rather disagreeable taste. I passed three or four water-holes on the way, the Caffres, as usual, having deceived me. We arrived at the banks of the Imbabati River, which, as is usual with these streams, had a few pools here and there, the rest of the bed being of dazzling sand, which, on being scraped away, exposed beautifully clear water.

We slept at some kraals deserted by the owners from fear of an attack from Umzeila's people. I saw these men hidden in temporary huts some distance back. As a rule, I generally slept in the open; but on this occasion slept in a hut, as it was chilly.

On starting in the morning, I crossed a stream of water running into the Imbabati River, which immediately lost itself in the sand. I crossed the above-mentioned river some time after starting, and after partaking of my lunch of cold giraffe and hot water, we emerged in "open forest," a distinct thing from "open bush," and consisting of large trees, between the trunks of which you could see a great distance, the ground being entirely destitute of under-growth: the trunks are bare to the topmost branches. I saw some spoor of rhinoceros and lion here.

The appearance of the soil here alters considerably, being composed of a coarse gravel of disintegrated quartzose rock, with constant outcropping of rock very much mixed with mica. The country further on towards Imbondune's kraal (s. lat. 23° 29′) has better soil and water, but it is all of the same unvarying flatness.

I here met with the "Zenondo," a scarce antelope called by the Dutch "Bastard Hartebeeste," though I failed to see any resemblance between it and the true one; in fact, it more resembled the "Blesbok," but without white on the belly and face. Its horns are small, and it is a very handsome animal, about the size of a donkey.

The country continues to improve, the trees are more scattered, and the grass grows higher and thicker. I here left the usual low plain and ascended a rise of about 100 feet, which appeared flat on the top. The country is thickly inhabited, and is well cultivated.

After proceeding some little distance, I came upon a spring, which the Caffres informed me was only allowed to be drunk out of by "inkosi" (chiefs), and that "abafokazan" (poor men) were killed if they drank of it. I was told to go to the Chief Imbondune, but preferred sleeping in the open away from kraals. He visited me about 4 o'clock, and wished me at once to go to his kraal, which I declined then. Next morning I went to visit him, and by a path made through impenetrable scrub for about 2 miles. I was then presented with some peculiar dry food, which he would not let me boil or cook in any way; it was something like meal, but had a taste as if some flavouring had been put in. I ate some, and was then presented with "tshuala," a kind of beer made from "sorghum." When good it is of a pink colour, with a strong disagreeable smell. It is slightly acid and very distasteful at first, but one gets soon fond of it. I drank a little of this.

I had presented this man, both on his first visit to me and on mine to him, with wire and beads, of at least six times the value of his present to me, but he begged for more. After eating his food I began to feel ill, and towards evening was extremely sick. I believe that I had been poisoned; of this I was more strongly convinced by his subsequent behaviour in refusing his people permission to sell food to me, and persuading four of my men to desert, as well as from what I afterwards heard of him from Mr. Reeves, who had been here.

Hearing that Mr. Reeves was at no great distance from me, on the Lipalule River, I sent a messenger with a note, who returned next morning with an answer, and a little flour, coffee, pepper, and dried vegetables. The note from Mr. Reeves expressed his regret at his inability to accompany me, as his bearers refused to go. For his great kindness in sending me these supplies I beg here to be allowed to thank him. Taking the advice of an older traveller, I had provided myself with tea and salt only. On attempting to start, all my bearers refused, and Imbondune would not allow any of his men to go until I should give him a blanket. I did so, and he then said, "I have no power, I am only one of Umzeila's captains; this is the kraal of the First Captain of Umzeila, the Great Chief." After haggling for about a day, and getting six of my men to agree to go as far as the confluence of the two rivers Lipalule and Bembe, I left my Natal Caffre, Adam, in charge of my goods, and started, intending to send back for them. After getting on some 40 miles, I came upon a kraal, and engaged three Caffres there to return and bring on the things. The next day I got the first view of the Oliphant's or Lipalule River, which was bordered by highish ground on this (south) side, being the fall of the rise before mentioned. At 5 o'clock we made our bivouac on its bank, surrounded by herds of game, amongst which was the "tetla," or water buck; and now and then the deep bark of the hippopotamus, which are numerous in the river, boomed forth. I gazed on this stream with great delight: a lone white man, in an unexplored country, looking at a stream which I was to follow through hardships little dreamt of then.

I crossed next morning, the Caffres hallooing and beating the water to scare the crocodiles. The river was about 200 yards wide, and, at the point crossed, about up to the armpits in the deepest place. The stream is swift, now calm and deep and then shallow and rapid. The bed is sandy, and the banks densely wooded with large evergreen trees of sufficient size to make middling planks. After walking through thickly-inhabited and well-cultivated land, we came to a kraal; where I was requested to stop until the Chief was informed of my arrival. After waiting about an hour in the hot sun, I would wait no longer, and started by myself to see the junction of the streams, which was not far off. After leaving the kraal, and going about 3 miles, I saw, in the glory of a setting sun, "the meeting of the waters."

I encamped myself under a large tree on the banks of the Lipalule River amidst Indian corn, which blooms and ripens at all seasons of the year in this valley, the soil of which appeared extremely rich. Every evening and morning immense flocks of green parrots used to perch on the trees, screeching and screaming, awaiting an opportunity for a swoop down into the corn, which was protected by Caffre boys hallooing and whistling with all their might to keep these pests from their crops. I hardly ever bought a head of maize that had not a great piece ploughed out by the parrots. It is noteworthy that this spot has never been known to fail of green maize.

As I should be obliged to wait some days for the arrival of the goods I had left behind, I had ample time to look about me. My Caffres having only engaged to come thus far with me, I paid them, and they returned. I was therefore left alone to gather firewood, cook, &c., and draw my own water, but I suffered little inconvenience, as food was good and cheap, and the Caffre boys occasionally brought firewood, for which I paid them beads. My food chiefly consisted of stamped, ground, and green boiled maize, sorghum, beans and ground-nuts, and occasionally fowls and fish, when I could purchase the latter.

At night, after the Caffres had gone, I endeavoured to get some observations by fire-light, as I had left my lamp behind. I obtained two or three observations for latitude and variation; but was not satisfied with my observations for longitude, though I succeeded pretty well with one or two; but after three or four nights of this sort of work, beginning about eleven and leaving off about one, I abandoned it. The sun and moon not being visible at the same moment necessitated the observations being taken by the moon and stars, and I am afraid the length of time consumed in taking each set, from my having to make up the fire after each observation, will prevent them from being of much exact value.

On the arrival of my things, some six days after my getting to this point, I determined to move across the River Bembe to where I should be less disturbed, and have the advantage of the shade of three "Imbangana" trees. The Imbangana is a most beautiful evergreen tree about 40 feet high, with leaves much the shape of a horse-chesnut, but of a dark shining green colour. Under a clump of two or three of these trees there is quite a "dim religious" shade, and the soil underneath is generally damp from want of light and air, as the branches on the outside approach the ground. I was informed by the natives living here that no Tsetse-fly exists within some distance of the banks of the river, and that at one time they possessed cattle, but the Amaswazi had so plundered and harassed them that they had ceased to keep any, so that their enemies should no longer be enticed down by hopes of booty. "Our ivory," they said, "we can hide, but our cattle we cannot."

On examining my goods I found that Adam, my servant, had helped himself to twenty or twenty-five pounds of beads, which I suppose he had been frightened into giving to the natives, as he was a most arrant coward, and used to cry like a child sometimes when he could not persuade me to turn back by tales of the murders which the natives lower down are said to have committed. This theft of beads afterwards caused me much loss of time, great anxiety and hardship, and, in fact, nearly cost me my life. I asked the Chief to supply me with men, accompanying the request with a present as usual; he replied that he would endeavour to accompany me himself to Manjobo's kraal, some two and a half days' walk down the river. As he said he could not start for four or five days I made the best of my time by taking observations, and found the confluence of the two rivers in latitude 23° 34′ S., and longitude 33° 40′ E., in round numbers. I could not obtain an observation with the sun, and only obtained two meridian altitudes for latitude, on account of the constantly clouded state of the sky, which generally was clear towards early morning and until ten or eleven o'clock, but, after that, bank after bank of clouds would blow up from seaward and completely obscure the sun.

I noticed during my journey that the prevailing winds were either from the south-east or north-west, the former damp and cold. The temperature of the water was 64° Fahr. The mean of several observations of the air in the shade gave at 9 A.M. 73°, at noon 77° to 82°, and at 3 o'clock P.M. 88°. Observed several times for variations of the compass on the route N. 22° W. and N. 22° 30′ W., but having only a small Troughton and Simms' pocket prismatic compass, these cannot be relied on nearer than 30′.

I caught some very curious fish, averaging about 3 lbs. each in weight and 18 inches in length. They are of a beautiful silvery colour with a brownish tinge on the back, marked longitudinally with blue stripes, not unlike a mackerel. Their fins and tails are tipped with red; they have a peculiar fleshy fin about half an inch square, placed between the back fin and the tail: their scales are large, of a square shape, and rub off with the greatest ease. But the mouth is the most wonderful part of them, the upper jaw having eight teeth about an eighth of an inch long, and projecting, so that when the mouth is closed they appear outside and overlapping the under jaw, which is perfectly toothless. I also bought from the natives two other kinds of fish, one of the Silurus species, very different from the ordinary *Silurus Glanis*, so common in Africa, both north and south, and the other a fish very similar to our ordinary English bream, but of a darker colour. This latter species inhabits the muddy streams flowing into the river. The former kind, judging from the specimen I saw, and which I believe had not attained its full growth, being only about six inches long, is of a semi-transparent appearance, like a smelt, of a light brown colour, with a smooth skin and the ordinary feelers. It has also a small dorsal and two shoulder fins and the usual eel-like tail. The other fishes inhabiting this river are the *Silurus Glanis* and the common "scale-fish" of Natal. All the fish, with the exception of the latter, which is full of small bones, are very good eating.

A great many wild geese of two descriptions are to be seen wading about during the day, but in the morning and evening they quit the river-side to feed in the Caffre "gardens" on the banks.

The chief at last presented himself, with men, and we started towards the middle of the day. After leaving the river some four miles away, we skirted a long lake, called "Lifugwie," about 1½ mile long and 1000 yards broad, fringed with reeds, but presenting a fine open sheet of water in the centre, which is frequented by sea-cows, alligators, and fish innumerable. I believe the path thus far trends towards the kraal of Umzeila, the paramount Chief on the U'Sabia River, according to the natives some 15 days' walk northwards from this.

We soon after regained the bank of the river, passed along it for some 4 or 5 miles, and, much to my disgust, had to stop at a kraal which is situated on a rise of about 150 feet above the river and about 1000 yards from the bank. The surrounding country can be well surveyed from this slight elevation, and the Bembe be seen meandering its way in the distance until lost to view in the high trees along its banks, from the brighter verdure of which it may, however, be traced for some miles further. Next morning my men refused to go on, but with persuasion, threats, and the influence of their Chief, slight though it was, they were at last induced to start. The custom or law is to pay your bearers beforehand, so that you are completely at their mercy. That night, after a very hard walk, we arrived at "Injobo's" kraal, passing on the way through very thick bush. On our arrival I found a difficulty in getting food, but at last procured sufficient for that night. As usual, my blankets were put down under the nearest tree, of which two or three are generally left standing in each kraal, and I slept as only weary men can sleep. On awakening next morning what was my dismay to find that all my bearers had deserted, leaving me still two days' journey from "Manjobo's," the place agreed upon.

I had paid these men my last salempore and large blue beads, the remainder of my goods being almost worthless, consisting of five blankets and some 40 lbs. weight of small beads and files. I tried to hire men, but could not; and the owner of the kraal refused to take charge of my things, until on my saying at last that I would leave them whether he would or no, he agreed to keep them for a day or two until I could hire men to return for them. Luckily, my friend Macigamana had persuaded one man to stay, so that with the help of his two small sons, the man, and my own servant, I was enabled to carry my sextant, horizon, blanket, cooking-pot, and a few goods. That day we passed through a country where the bush began to get stunted and scattered, and slept at some kraals on the Benjane River, a small stagnant stream about 20 miles in length; and after crossing this two or three times, the next day I saw its embouchure into the Bembe, and soon afterwards arrived at Umhamba's kraal. The chief Macigamana stayed at a kraal (Matonse's) on the road, and did all in his power to persuade me to do likewise, but no persuasion would prevent my going on, so that, although my servant almost refused to accompany me until I used threats of dreadful violence, and notwithstanding that I could get no one to show me the way, I shouldered what goods I could, looked up Adam, and started; however, after walking about two hours, I employed a man whom I met to carry some of my burden and point out the road to Manjobo's, where we arrived about 5 o'clock P.M. I went down to the river and had a delicious bathe, bought some boiled maize for supper, and went to bed. Next morning Macigamana sent to ask me to wait for him, as he was coming. I employed the interval in taking observations for longitude and variations of the compass, as the day was a superb one with both sun and moon in view. About noon we started along the banks of the river, and after three hours' walk came to Manjobo's, passing on the way signs of old kraals, like "fairy rings," denoting that there had been at one time kraals at this spot, about half-way between the two kraals of Umhamba and Manjobo. I afterwards ascertained that these kraals were formerly the residence of the late Chief Shosongaan, father of Manicose, whose place is laid down in Hall's map, but incorrectly.

Manjobo is the commander of the forces for this district. Umzeila, the Chief, being afraid that his precious life might be forfeited by such close proximity (as 250 miles) to the Amaswazi, has removed himself some sixteen days further off; and naturally his subjects here, at such a distance from the seat of government, display all the characteristics of the savage, who is only kept under decent control by the immediate vicinity of a strong hand, and the fear of severe punishment. This Umzeila is not the rightful heir to the throne, but Mawerwa, his elder brother, who first succeeded his father, Shosongaan. After some four or five years, however, the people got tired of the *mild* form of government he had adopted of killing all the men unfit, from age or otherwise, for going to battle, and the young ones naturally thought that on his not finding any more old he would begin on the young men, and as Umzeila had made one or two nearly successful attempts to dethrone Mawerwa, the nation invited him to accept the throne. After obstinate resistance, Mawerwa was deposed, and fled to the Amaswazi tribe, who rendered him assistance on three different occasions to regain his throne. On the third attempt so many perished from thirst and sickness, that the Amaswazi refused him any further aid, and he has since lived in the Amaswazi country, resigned to his fate. Since Umzeila has assumed the chieftainship there has been peace between the two tribes so far that the men of one do not venture to intrude on the territory of the other, and the country on their boundaries is depopulated for about four days' walk.

On my arrival at Manjobo's I heard that some white men were at the "Amanzi Inhlopi," or white water, and that they intended to come to the Bembe. After trying in vain for four days to persuade Manjobo to give me some men on hire to return for my things, I went back to find my friend Macigamana, and to induce some men to accompany me to Injobo's. I found him at Matonse's kraal. My servant Adam here complained of headache, and fearing it was due to fever, I allowed him to remain, and went some thirty miles up the river with four men to Injobo's. On my arrival there I heard that the white people had reached the Bembe and were some three hours' walk distant. Thinking it might be Mr. Sanderson, I determined to go to them. Having sent my things on, I started for Umlanjane's kraal, where these men were, and on my arrival found them to be Messrs. Wood, and Dubois brothers, from Natal. I was glad of this, as it went against the grain to have to share the discovery, which I felt certain that I should make, with any one, although I should have felt it my duty to do so. They kindly gave me the goods I wanted, and I started on my return. On my arrival at Matonse's, I found that Adam had not only paid the men double their allowance, but, as on the former occasion, had helped himself to goods and spent them unnecessarily, as I had paid for his food during my absence. This was beyond human endurance; I therefore thrashed him, and he ran away. As I was obliged to be back at Umlanjane's within nine days from starting, I could not wait for his return, so gave directions that he should follow, and then started alone, as I could not hire any bearers, the chiefs being adverse to my proceeding. I shouldered waterproof sheet, goods, ammunition, gun, pistol, sextant, &c., and some honey I had purchased, about 45 lbs. weight in all, and started for Manjobo's. In three hours I reached Umhamba's, where I rested, and after carrying this burden about two hours longer, I overtook a man proceeding in the same direction, who, for a consideration, consented to carry part of my load to Manjobo's, which I reached an hour afterwards. As my servant did not come with the goods deposited at Matonse's kraal that night, I started early next morning, leaving as much as possible behind, notwithstanding which I suppose I carried some 50 lbs. weight. The country here loses its thick bushy appearance, becomes grassy and open, with here and there euphorbia, and a few vegetable-ivory trees, very similar in appearance to coco-nut trees. I walked all that day with only honey for food, and towards evening reached an immense bend in the river, extending north-easterly for about six miles. I therefore enquired the way to the sea, and was told that it crossed the river. On hailing one of the "Dug-outs," and after being kept waiting about four hours, I was condescendingly ferried across in this fearfully ricketty machine, half full of water, for a few beads. I bought some sweet potatoes, and that night was taken to the petty chief living there to sleep. In passing along the river I was surprised at the countless number of crocodiles infesting it; on one little sandy island, some 50 feet in diameter, I counted no less than fifty large, besides numberless small ones, and on this account, although the river is fordable in some places with water about 4 feet deep, canoes are used. About four miles further down is the limit of the tidal rise.

Next morning I engaged a man to carry my things to the sea, making his Chief a present and paying him in advance, although on starting I did not feel much elated at having procured this assistance, for I noticed that the man omitted to take his rug with him, and I therefore knew I might expect to be deserted at any moment. After proceeding about a mile or two he put the things down and asked for more payment, and on my refusal to comply with his request, left them on the ground and walked off. I put the best face I could on the matter, and, shouldering the whole of the things, went on, trying to dispel dull feelings and angry thoughts by whistling a tune, but I am afraid it was a miserable failure. I trudged on that day, asking the natives I met, in the little broken Caffre I could muster, if I was going right, and was generally answered, "Yes; that the sea was three days' walk." About two o'clock in the day I came to some very large kraals, which I was informed were the Chief's—I was also told that he was over the river, and that I must wait for the boat. I waited for some time, but whenever I approached a boat the ferrymen immediately pushed off; therefore, seeing that I was to be detained that night on this side, I made an effort to continue my journey without crossing the river, but soon returned, as the natives insisted that the road to the sea was on the other side of the river.

I had great difficulty in buying food, as my stock of goods was low, and the natives, as usual, profited by the occasion of a lone white man being in their power, not actually to rob by force, but to starve his goods out of him. I therefore contented myself with some sweet potatoes and a fowl.

I held a grand consultation with all the councillors, and they agreed in stating that I should sleep four days on the road before I reached the sea. Consequently, as I had only one ring of brass wire left with which to provide myself with food, I decided to return next morning. Here, as also at Manjobo's, the natives were surprised at my white face and hands: "This is a white man," they said, "the Portuguese call themselves white, but they are red" (imbomvu). I told them my body was whiter than my face. "Take off your clothes and show us," said they. I told them that white men did not take off their clothes in public, but I would show them my chest, at which they were much surprised and delighted, and said my skin was "very pretty." I infer from this that they had never seen a truly white man before, and that therefore the statements of certain Dutch Boers and hunters of having visited this country are not true, and that, with the exception of those natives who had been at Delagoa Bay and Inhambane, they had never seen an European before. They told me it was five days' walk to Delagoa Bay, or Umvuma, as they called it, at the mouth of the Umkomogazi River, the Umkomati of the Boers, and Manhissa, or Manicose, of the Portuguese. They have still another name for the river here, "Meti," which adds one more to the list, Limpopo, Krokodil, Ouri, or Bembe; and, as my observations seem to point out the Inhampura River's mouth as the outlet, the list may be still further increased. In ancient geography the river is called "Spirito Sancto."

Next morning I started on my return, accompanied by two men, I suppose as guards, to prevent my dodging down the river, and I accomplished the same journey down in one day which I had taken two for on a former occasion. Neither of these men would carry a single article for me. I was as poor as an "Umfokazan," which is here a more heinous sin than it is even in Europe. I was no "Inkosi," I was not even a rich man; and could they, the king's messengers, be expected to carry things for an "Umfokazan"? This was the invariable reply when I asked them to relieve me of some of my load.

Two days afterwards I got to my friends Wood and Dubois, with the intention of abandoning my purpose if one of them would not accompany me, as I found that I could not get on from want of bearers and my inability to speak "Zulu," the language of the country, and in consequence of the contempt and suspicion with which they regarded a white man carrying his own things in pursuit of an object which to them seemed so absurd. I heard from Wood that McLachlan and Ash, who had been so kind to me in Leydenburg, were about 3 hours' walk from the river, trading. As all the assistance they could give me had been rendered, they advised that I should see McLachlan and get his help. They said also that Robert Dubois, having gone to Manjobo's in consequence of the reports I had brought, would perhaps, from his great knowledge of the language, obtain some information upon which I could act. I therefore went over to McLachlan, and he advised me on no account to give up my object, thereby wasting the expense, trouble, and anxiety to which I had been put, and he said that he had ascertained that the sea was only five days' walk from where we were, and therefore not more than two from where I had turned back. He generously allowed me to hire two of his men, and as they did not know me, stood security for the (to them) handsome payment of five blankets each for the trip down and back. He gave me all the goods I wanted, and treated me with the generosity for which he is well known. Allow me here to record my thanks to him, and also to the two Dubois and poor Wood (whose death will be mentioned) for the kindness shown to me by them.

I returned the next morning to Umlanjane's, and heard from Mr. Edmund Dubois that Manjobo had sent to enquire of my whereabouts, and, on being told that I was returning homewards, said, "It is well." Dubois seemed to interpret this into a threat; but, after consulting McLachlan, I determined to proceed. After a walk of about 70 miles, I reached Manjobo's for the third time, and there found Messrs. Robert Dubois and Ash. I consulted with Dubois, and got him to interpret to Manjobo and explain the object of my journey; but this Chief still refused his permission to my proceeding, and said that if I went it would be bad for me. Dubois asked what he meant.

He said, "Oh! he will not be killed; but he will be lost, and you will hear no more of him." I continued my journey, notwithstanding.

Near this kraal I saw a large herd of about 30 sea-cows. I would not shoot any, as the Caffres who had treated me so badly would have reaped the benefit. Dubois shot one, which came to the surface about 8 o'clock, two hours after being killed. He and some 30 Caffres and myself removed to the river. Dubois, having just recovered from fever, did not like going in, and until I led the way no Caffres would go and drag the sea-cow out, for fear of alligators. After being shamed into it, some followed me.

Beyond Manjobo's the country is still open, and thickly inhabited near the river, and on the few streams flowing into it. The soil is of the richest alluvium, and produces every variety of "native" food, principally maize, sorghum, sweet potatoes, yams, sugar-cane, bananas, and several varieties of beans, as well as tobacco of a better growth, and more carefully cultivated than a great deal I have seen grown in Natal by Europeans. The leaves are enormously large and round, and the natives understand the practice of "nipping" off the blossoms to give greater strength to the leaves, and hand-weed and hoe the plants continually. I think I omitted to mention that the sands of the river contain numbers of small white shells, about as large as a "silver penny," of the cockle species, more numerous from Manjobo's to Siduda's than elsewhere. I have no idea whether these were fresh- or salt-water shells, but from the uniform level of the country, and the fact that I saw somewhat similar shells beyond the limit of brackish water, I think that either the tide had at one time ascended further up the river, or that the sea covered this tract of country, and that these were marine shells. I also observed at Isingfungatane's kraal, in fresh water, a description of periwinkle on pieces of old timber and canoes. I much regret not having brought back some of the small "cockle shells;" but after having collected specimens, I threw them away, intending on my return journey to get more; but owing to anxiety, starvation, exhaustion, and fever, my thoughts were then more directed to the preservation of my life than to the evidences of geological formations.

While I am on the geological theme, though no geologist myself, I think I may venture to state that the country is of recent formation, from the fact of the shells referred to being found at considerable depths below the surface, and from the existence of newly formed sandstone like that found on the

"Bluff" at Port Natal on the sea-shore, and at Umhamba's. I observed that this stone generally presented a flat surface full of holes and depressions, and that although hard, it was rotten and porous.

With regard to the appearance of the country higher up and along the course of the Lipalule or Oliphant's River, I think it may be referred to an older formation, as amygdaloid, quartzose rock, and ironstone, present themselves above the ground, more especially about the Sorgobiti River.

I think at one time the ocean must have covered this country, on account of the generally sandy nature of the surface, and the worn appearance of some of the rocks; but I also remarked that the ironstone had been little affected by anything except what might be ascribed to atmospheric causes.

To return to my weary journey. I arrived at Siduda's kraal about one o'clock in the day. He kept me waiting about an hour and a half before he condescended to appear. His first words were, "I am a Chief, I am the Great Chief Siduda, a Bonguni (direct descendant from the Zulus), I speak only through presents" (harkerlê). This was not a pleasant reception, and his subsequent conduct was in accordance with it. I gave him a present, and explained my object to the best of my ability, as neither of the men I got from McLachlan could understand English, or much of my indifferent Zulu, as they were either of Manjaje's or Umjaje's tribe. The Chief himself spoke pure Zulu, which enabled me to understand and explain things after a fashion. I told him that Ash wanted to buy ivory, and that if he sent for him with a note from me he would come. He replied, "Yes, that was a good proposition; that my two men must go with a note, and I must remain until they returned, and that he would send a messenger to Manjobo to see why I had no one from him." Now, knowing that Manjobo was against my going on, I determined, at all hazards, to get to the sea before he could be communicated with, as I knew my fate if he once heard that I was determined to go on. I therefore replied that it was impossible, because, if Ash came, I wished to shoot hippopotami (imvubu) with him, and that I could not do so if I had to go to the sea then. Siduda insisted on his proposal; I at once started, but my two men refused to follow. I, therefore, was once again alone, without bearers or instruments, and with but few goods; but with a stout heart I set out. I was followed by about fifty natives, who poked sticks in my face, and otherwise tried to hinder me: at last one caught hold of my gun, which was on my shoulder; I could not shorten my grip soon enough to deal a blow, as the "swarm" was rapidly closing on me, I therefore drew my revolver, which I had before luckily explained to them as having five men's lives at its disposal. On its appearance they left my gun and kept their distance, and, soon after, went away; but I had not proceeded far before I was again followed, and told that Siduda would give me a man to go to the sea if I would return. I therefore made them go in front and did so. Luckily I kept a sharp eye on their movements, for, as the path led through a fence of reeds, I observed them, through the chinks here and there, clustered and stooping behind it ready to pounce on me. Seeing this, I passed through another opening some ten yards behind them, and, until I turned and laughed at them, they were unaware of my whereabouts, but as intent as ever, with their hands all ready for a pounce. They all came away like dogs with their tails between their legs, amidst the derisive shouts of the old men and councillors assembled under a tree hard by. I was requested to sit down amidst the throng, but I asked that all might sit in front of me, as I had already experienced their attentions: this was received with laughter. I was then shown the man who was to go with me; but, knowing their lying propensities, I scarcely looked at him, beyond seeing that he was a councillor, and therefore not likely to serve as a guide. My two men, who had in the mean time started homewards, were sent for; but only one was brought back, almost by force, and the other was considerably expedited in his retreat. I imagined that these men had been persuaded to run away, and that the one was made to return. I therefore told the Chief that Ash would not come unless I wrote, and that the runaway would only be punished for his cowardly and treacherous conduct by his master. He therefore proposed that my servant should go, together with a messenger from him, and that I should be supplied with a man to accompany me to the sea. I therefore wrote the note, and next morning I went one way, and my servant another; and I was thus again without any one accountable for my safety. But little did I care when the accomplishment of the object of my journey burst upon my view, through an opening between two sand-hills, looking like caps of snow in the distance. Between those hills ran the Bembe River, and on the other side was its mouth. I felt capable of undergoing anything at that moment, forgetting the solitude, sickness, and despair I had suffered; forgetting that I was at the mercy of savages, and that I had to walk 600 miles before I should again behold "home, sweet home." Those only who have suffered the same hardships can appreciate that yearning for civilised society, and that dread of passing again through the trials and dangers I had experienced. I slept at Isinfungatane's kraal, on the southern side of the river, and recrossed again next morning. After going along the bank, and passing through part of the "fen" I had waded through for four hours on the previous day, I crossed three small streams, left the immediate bank of the river, and began to ascend the Umtshan-tshan hills, to avoid a large marsh which is impassable, and which stretches from this point to the hills bordering the sea, and on each side of the river for about 5 miles.

There is a great change in the country here—fine grassy hills dotted with clumps of bush, and views of the sea-range in the distance, displaying the bare sand in places, make their appearance. The soil of these hills is red, and is much like the soil of some of the coffee-land at Natal, on the coast. I observed in the valleys below small, clear, fresh-water lakes, and here and there a marsh, with papyrus-rush rearing its fine hairy head to a height of 20 feet, from stems as large as my arm. To the right was the marsh I was skirting, stretching for about five miles to the river and beyond to some hills, under which flowed the Inculuzane River, which discharges itself into the Bembe within some three miles of the sea. I ascended a rise, and the Caffre said "There is the sea" ("Nantsi Luanhla"). I then passed through thick bush, which borders the coast, and arrived at the Indian Ocean.

As it was only about 4·30 P.M., I wished to go at once along the beach to the mouth of the river, which I judged was about eight miles to the southwards; but my bearer and guide would not accompany me; I therefore told him to await my return, and I started alone. I did not get along very fast owing to the steepness of the beach, which left little hard sand. About six o'clock, seeing a path through the bush, I climbed up, hoping to obtain a view of the country, but I found it only led to some temporary fishing-huts, and, seeing evidences of habitation, I determined to stop there for the night. I tried to penetrate further, but found it impossible from the density of the scrub. The Caffres returned meanwhile with some water they had got at the lakes referred to, and also with shell-fish which they had collected, consisting of "sea-eggs," mussels, and some other species. They gave me water, and, in return, I gave them some "stamped" maize (U'parsula), and we three made our frugal supper off the shell-fish, roasted on the embers, and the "maize," with "Adam's ale," which had been my drink for the last few months.

Next morning, before sunrise, I got under weigh, and walked for nearly three hours without reaching the river, and, seeing some natives coming down to the beach in the distance, I beckoned them to approach. On their arrival I asked where the "Bembe" was. They said "There"—pointing a mile or so on. I certainly saw a faint black line, but was so convinced that the river could not enter the sea in so insignificant a manner that I employed one to show it to me; he went about 500 yards on to a small rise of sand amidst the surrounding waste, and pointed out the lagoon and mouth of the river, which was now plainly before me. He then turned back and left. A few moments after, I stood gazing on the long-sought mouth of the Limpopo or Bembe River.

The thought crossed me, Is it worth while "to have gone through so much to get so little"? A stream of about 300 yards wide (at full tide) flowed into the ocean, and although it was not rough inshore, I noticed the sea breaking some three miles out, not in one "roller," as on a bar, but in a succession of small "breakers," until it reached the shore, thereby, I think, demonstrating, that though no marked sand-bar existed, there was great shallowness of water outwards for about three miles. Whether or not channels exist through this sand, I am unable to judge, having had no means of ascertaining the fact. I waited until noon for observations.

As the natural horizon was concealed to the northwards by land, and as, already mentioned, the loss of my mercury prevented me from using an artificial one, I was obliged to take a back observation for latitude, and was prevented altogether from getting the longitude. As the coast-line has been pretty accurately laid down by abler hands than mine, and with better appliances than I could have used, I do not so much regret this; having settled satisfactorily the latitude by a "reduction to the meridian" and a "meridian altitude," I found that the mouth of the Limpopo River is situate on the eastern coast of Africa in lat. 25° 15′ 09″ s., according to a meridian altitude (or by a reduction to the meridian—an approximate method—25° 15′ 29″ s.), and in about 33° 42′ of E. long.

The shore on the northern side of the river is a flat of loose sand, evidently overflowed by the river occasionally in summer, and perhaps by the sea at spring-tides. More to the north, up the coast, high sand-dunes, in some places clothed with scrub almost to the summit, but in others in their naked dreariness, appear. The sandy ridges and bare patches give the appearance of snow when seen at a distance inland. There is a lagoon, about one mile wide and five miles long, and a channel, about 100 yards long, connects it with the ocean. I bathed in the mouth of the river, but on account of crocodiles and the feeling that if I was lost no account could be given of my expedition, as I was alone, I refrained from going further than where the water reached my chin; this was about 20 yards from the shore, and at that point there was evidently a deep channel, as the bottom shelved so sharply that I could hardly stand. This was at low tide; and I much regretted not being able to see the place at high water. I retraced my steps, and found my man awaiting me; I slept on the shore that night, and made Isingfungatane's kraal next day. This kraal being on the southern side of the river, I was obliged to cross, and as it was raining, no Caffres could be seen outside their huts, neither could they be brought to the river by shouting; I therefore told the bearer to swim across for the boat, but he refused, and said, "There are crocodiles, who bite men." I then jumped in and swam across, as it would have been certain death to have remained in wet things all night.

I found the river far out of my depth from bank to bank, and until then was unaware of the weak state I was in; I could hardly reach the opposite shore, though the distance was only about 300 yards. My clothes were half-dried during the night, and I reached Siduda's next day. Here I found my servant, who had been with the messenger with the note for Ash. He had returned before my messenger got to Manjobo's, and therefore he had not seen him. I then wished to start, but the man who took me to the sea insisted upon more payment than that which had been agreed to and already given before my start; I refused and tried to force my way, but found that the natives behaved in the most insulting manner, poking sticks in my face and beating my servant. I therefore returned to the Chief, and asked what he meant by allowing such behaviour; he only laughed, and told me to pay the man again. I explained how impossible this was, as I had only one ring of wire and some honey to provide myself with food for the four days' journey which I must make before I could reach my friends: he still said that I must pay. One of his councillors asked to look at the wire. Knowing that he would keep it, I refused to give it; but on his promising to return it, I let him have it, but could not get it back again. I felt much inclined to hit him between the eyes, which were temptingly placed within a very convenient distance for such a purpose; but as this would have been the signal for my instant destruction, I "stayed my hand" and made another attempt to start, but was again detained and had at last to abandon my large pot of honey, of which I had already given them half. This appeared to appease their thirst for plunder, as nothing else was left for them. Before I gave the honey they were getting very excited, and had caught hold of my gun once or twice; but on my presenting my revolver they relinquished their hold. I was afraid every moment that some adventurous spirit might be tempted to strike me with a stick, which would have necessitated my shooting him, to prevent the signal being acted upon by the rest of the crowd. I slept at a kraal some three hours' walk further up the river, which marks the place of the furthest extent of the tidal rise.

I had made a present to the owner of this kraal on my first journey, and now begged that he would give me some food. For a long time he said there was not any; but on my saying to him that I saw some pots, containing sweet potatoes, and others, with lids on, on the fire, but that I supposed they were only sticks for muti (medicine), and so on, in a chaffy way, at last he was shamed into sending some "stamped" maize, though not nearly enough for one small appetite, much less for my servant and myself. Happening to have a blue handkerchief, it supplied one feed for the next two and a half days' walk, during which I suffered the most frightful headache that I have ever experienced —the first decided token of fever. I arrived at Umlanjane's on the evening of the ninth day from my start from Manjobo's, having walked 140 miles at least, and on two successive days for eleven hours each day without stopping. Deducting three days from this time for compulsory delays, I still had six days' walking, in a state of high fever.

My friends were gone—McLachlan to the south-west and Dubois to the south-east. There was no alternative but to follow as rapidly as possible, and as Dubois was the nearer and the natives seemed to know more about him, I followed on his track, though my large gun, clothes, and artificial horizon were with McLachlan. I afterwards regretted not following McLachlan; but at the time I knew not whether the man who had deserted with my horizon had gone back to his master. On account of the want of goods wherewith to buy food I could not follow him, and as Dubois had left messages to the effect that what I promised in his name would be paid, I was enabled to follow his track with greater ease. I stayed a day at Umlanjane's, as I felt utterly incapable of proceeding with this fearful headache, but started next day, and on the succeeding morning arrived at Umchabele's kraal, where I found Dubois' party.

Mr. Jonathan and Edmund Dubois were in a state of high fever, had their heads wrapped in wet clothes, and were incapable of the slightest exertion. Five Caffres were also in the same condition. About an hour after my arrival Mr. Robert Dubois returned, also suffering severely from the effects of the charge of a buffalo, which had knocked him down, split all the flesh off his thumb, and so damaged his ribs that for a month afterwards he was almost helpless.

One of the native hunters had wounded a buffalo, which he was afraid to follow. Dubois, therefore, took up the trail; an unarmed Caffre accompanied him. This man saw the buffalo in a bush, and tried to point him out to Dubois, who was however unable to see him; they, therefore, moved round the bush, and the buffalo charged, before Dubois, who was still weak from fever, could raise his gun; the brute knocked him over and began pommelling him with his muzzle and kneading him with his knees. Dubois raised his gun, whilst lying in this position, and tried to shoot, but found the hammer of it gone; he then tried to get his knife in order to strike the cap, but the buffalo's knee being on his side, he was unable to do so. Just at this moment the native, who had meanwhile been ensconced in a tree, came gallantly (for a native) to the rescue, and with an assegai stabbed the buffalo, and said, "That's my game!" the animal then left Dubois to chase the Caffre. At this critical moment the black hunter, who had originally wounded the beast, appeared; the other native then ran to him, took his gun and shot the buffalo, as it was again charging Dubois. It now appeared to me as if I had got "out of the frying-pan into the fire;" three men out of the four were incapable of helping themselves, and the fourth, myself, already attacked by fever—all the bearers and hunters being in a like helpless condition. I told Wood that I feared I might be an incumbrance to them; but he said, "Not to me, for I shall die here!" little thinking, poor fellow! that although he would recover from his present attack of fever, he would die so soon afterwards. In this pestilential spot we remained for a week, and then crawled on some four miles, being the utmost distance the weaker of the party were able to accomplish.

The next day we could only go six miles to some kraals, where we stayed about four days. The country since leaving the Limpopo was of the usual flat character, covered with bush. It having recently rained, there was an abundant supply of water, which lay in clear pools on the surface, and the streams were now running. The soil, being generally composed of coarse gravel, did not appear to be unhealthy: but I conclude that the unhealthiness of the summer months must be attributed to the exhalation of the pools of water which remain from the wet season, the country being nearly a dead level. It is sparsely inhabited by natives, who appear to suffer little from fever.

After this rest we managed to make in two days a distance of 20 miles reaching other kraals, where we stayed five days, unable to move from weakness. The Caffres, as usual, were sent to hunt, and, as I was the only one able to move, I went with them, but found that I had over-estimated my strength, and soon turned back, though even at that distance, some four miles from the kraals, I saw elands, giraffes, brindled gnu, zebras, and impalas, and my guide went off on the spoor of some buffaloes, one of which he shot. I had hardly got back when the Caffres reported that two or three lions had been seen, and that one which was feeding upon a gnu was not far off. I shouldered my gun, and was joined by a host of Caffres, who made such a noise that few lions, I should think, would have faced them; but the clamour grew "smaller by degrees and beautifully less," the nearer we approached to the "king of beasts," and on arriving within 500 yards, they all drew up in a line, and I at last got to the front, which I was prevented from doing before, from my inability to keep pace with the gang. I had not advanced more than 20 yards, when an animal, about the size of a fox-hound, sprang up and made off, tail on end, and at a pace which defied pursuit. This was a "live lion." Ill as I was, I threw myself on the ground convulsed with laughter, and called to the Caffres to "Catch him alive, O!" They set up a yell, which sent him whining with fright, and lent wings to his flight. This was my first and last lion-hunt, though there are plenty of lions in the country, as we heard them frequently, and the Caffres saw many.

We started then for the Sabi River, distant about 5 hours' journey. Skirting the eastern side of the Bomba Hills, which we had struck the previous day, and sleeping out one night, we came on the Sabi River. Poor Wood had all along been very ill and weak, and on arriving at this point declared his inability to proceed further. Caffres were sent a-head, to bring men to carry him, at all events, to an inhabited country, which this was not, the nearest kraals being those by which we had slept the previous night. This being the boundary between the Amaswazi and Umzeila's people, no bearers could be procured from behind. We encamped under a large tree on the banks of the river, and poor Wood bathed with me that afternoon for the last time. The fever having left the party, we were only suffering from weakness, and although Wood was the weakest, we had hopes of his recovery; but the disease took a fresh form, with which exhaused nature was no longer able to contend, and he gradually sunk, his latter moments being happily passed in a state of insensibility, having previously dictated a note for his only brother, to whom he bequeathed his property. Poor fellow, he was an educated and amiable gentleman, who had come to this pestilential place, more with an idea of pleasure than of profit. I felt his loss severely, as, from my greater strength, I had been his constant companion. On the first attack he had spoken of his death, but neither of us expected that it would occur on this second attack so soon or so suddenly. We buried him under a large tree by the bank of the river; other travellers, perhaps, may some day see the heap of stones, which here marks the grave of another victim to that restless spirit of enterprise and discovery which is characteristic of our nation. The greatest difficulty was experienced in digging the grave, all the implements available being a Caffre pick without a handle, and a tin dish: in spite of this, and of our state of debility, we managed to excavate a pit about 5 feet deep, wherein he was laid, and the beautiful funeral service of the Church of England was read; so impressive at all times, but doubly so to those who were themselves in the valley of the "shadow of death," and doubtful whether even such sepulture as this might be accorded to them. During this melancholy scene a fire was raging in the trees around, which had been kindled by our Caffres to procure some honey, and the trees fell so closely about us as nearly to destroy our few remaining things.

We started on the march soon after we had buried Wood. Edmund Dubois being scarcely able to drag himself along, and I being in but little better plight, we were not able to make much way. We had also chronic dysentery, caused by exposure to a scorching sun, over-exertion on foot by day, and heavy dews without shelter by night, and by the bad and scanty food obtainable, consisting sometimes wholly of vegetable and other times of animal diet; stinking maize or bad meat, accordingly as we were, or were not, near to kraals.

The next day it rained incessantly, and we were glad, on reaching the Umgweni River, to get into some deserted huts, so as to divest ourselves of our soaked garments, and dry them as best we might; meanwhile, wrapping ourselves up, by way of change, in our wet blankets. Being short of meat we determined to remain here a day to shoot some; the Caffres shot two buffaloes. This river is about the same size as the Sabi, both having a good flow of water in this the dry season, fordable in most places, and broken by falls and rapids.

The Sabi River passes through the Bomba Hills, and joins the Umkomogazi, or Umkomati River on the *eastern side*, but the Umgweni River joins the Umkomogazi on this (*the western*) side, about four miles down from this point, and immediately at the junction escapes through the range; a river further to the south, the Umlumazi, also falls into the Umkomogazi, on this side of the Bomba. Afterwards we crossed the Umkomogazi itself. This is, I believe, the only reliable information ever furnished with regard to these rivers, the latitude of which I much regretted being unable to lay down, owing to the flight of the Caffre with my artificial horizon. I tried all sorts of substitutes, but the breeze was always too strong for a successful set. The country begins to have here a more broken appearance, especially to the westward, where hill may be seen beetling over hill, until lost in the faint blue outline of the Drakenbergen; immediately along the eastern side runs the "Bomba," which shuts out further view. I believe this country is held to be comparatively healthy, and, from the good drainage it possesses, I should think that the fever, when experienced, would take a very mild form.

The next day we reached the Umlumazi River, and at once set the Caffres to work to shoot hippopotami; three were soon bagged out of a large herd of twenty. Having our minds set at ease by this plentiful supply of the best meat that "Wild Africa" affords, we determined to remain one day, to have a "blow out" and recruit our exhausted energies. On the first appearance of one of the dead hippopotami on the water, the Caffres refused to go in after it. I wished to do so, but Dubois advised me not, on account of the rest of the herd, which were "blowing" round about it; we therefore made a small raft, and with my legs dangling in the water on each side, I paddled into the stream. But the "river-horse" had floated off a shoal, and was now fast going down-stream; I therefore deserted the raft and swam after the animal; it came to the shore. After taking as much meat as we required, a great deal was left on the rocks; next morning not a bone of this was to be seen, crocodiles having seized the whole during the night. Little did I dream of their existence when I was disporting in the water the day before. It was so aggravating to be in a game country and have no shooting, that I determined to try for a sea-cow, but after three shots, causing me such pain each time that I nearly screamed, I gave it up and went to bed with a racking headache. The rain poured down unceasingly all night, and again saturated our clothes, which were not yet recovered from the previous day's soaking.

The day after this we left, and got to the first kraals of the Amaswazi; there being no inhabitants between the kraals mentioned further back, across the Sabi River, and these, owing to the constant war between the Amaswazi and Umzeila, the cause of which has been already alluded to. We were glad to purchase some "buswa," or millet-meal and maize, as it was about five days since I had tasted farinaceous food, and I was suffering from dysentery, which I attributed to the meat diet and "*coffee*," made from "burnt-maize." I therefore gave up drinking this stuff, and imagined that I should get rid of my disease, but found that unvarying diet of either kind had the same bad effect. The natives had no cattle, and no game was here seen; we had, therefore, now to live entirely on vegetable food.

We dragged ourselves along, Edmund Dubois being still very weak, and after one or two days' march, whilst still at some distance from a kraal, his strength failed him entirely. Two Caffres, his brother, and myself, then carried him between us. I shall never forget the weight of one-quarter of a man, which was my share of the burden. At this time I was so weak that I could not carry my gun, and, in fact, was so ill that I hardly knew whether I should be able to go on the next day. The additional weight of, perhaps, 40 lbs., and that in the form of a man who could not stiffen himself to allow of his being carried with ease, caused the perspiration to pour from our already reeking bodies, and left a sensation of horror on the mind which will not be easily effaced.

On our arrival in this miserable plight at the kraal, we determined to allow time for Edmund Dubois to recover before any further move was made. Food was scarce at the kraal, and our only other drink besides water—namely, Caffre beer, or Tsuala—was not to be had. We spent six miserable days here, constantly physicking Edmund Dubois with chalk, opium, and laudanum. He was so weak and irritable that he required constant attendance, and to be supported out of the hut occasionally. During this time we lived principally on guinea-fowls, and sometimes got a pheasant. We had, happily, sent on the Caffres, with the exception of two, to the waggon, still some four days' walk ahead, so that only half-a-dozen mouths had to be provided for.

The country was still bushy, but more broken and better watered; the Umkomogazi River, referred to before, flows past the southern side of the kraal. It is a small river, broken by falls and rapids, but, I believe, tolerably navigable immediately after it passes through the Bomba Hills at the Umgweni River. We made a miserable day's trek to Mahorbo's kraal, and I then persuaded Robert Dubois at last to leave his brother in my charge, and get as fast as possible to the wagon, to send back some brandy and other comforts for him; so he started, and we followed slowly. After passing over very broken, well-watered, and apparently healthy country, we crossed the Umbolosi River (not Umvoloose) and got to the wagon. The rats had eaten a great deal of our stores and destroyed all the remainder of the flour, and the clothes were filled with bugs; but, as we had been pretty well "broken-in" to every description of disgusting insect, we considered bugs comparatively clean. All our anticipations of fine feeds of bread were dispelled; we certainly did cook some, and, though full of rats' dung, considered it such a delicacy that it was determined to keep it for pressing emergencies. Milk there was in plenty, but until the system was thoroughly clear of fever it was a forbidden luxury. Calomel, salts, antibilious pills, and quinine (of which, luckily, I had a plentiful supply throughout the trek), together with some Dover's powders and soap and water, soon made us feel at least able to walk without pain; but the dysentery did not entirely leave the party until after our arrival in Natal, nor even then altogether.

On this river granite crops out—the first I had seen—and according to the native account it runs inland for a great distance. The country is more interesting than any I had hitherto met. It is open and grassy, with a little bush in the hollows, and masses of rock cropping out on the hills in every variety of form and colour.

We had been about thirty-seven days dragging our diseased bodies from the Bembe to this point, which can ordinarily be done in fifteen days easily on foot. I tried to get some observations here, but on account of the constant breeze I could not command a good reflection from water, &c. It is an extraordinary circumstance that during the whole of this journey from the sea the wind blew so constantly, either from the N.W. in the morning or S.S.E. in the afternoon, that I was unable to obtain an observation from any reflecting liquid surface, the only means available.

The country changes little further on; and besides the general absence of game, extreme salubrity, abundance of mists, and plentiful supply of water, there was little worthy of notice. No road exists; therefore it is not very wonderful that the wagon was capsized, the tent smashed, and a good deal of other damage done.

The White Umvoloose River was crossed, and afterwards the Little Usutu and Great Usutu, the Ingwempisi, the Umkonto (all forming the River Usutu on the western side of the Bomba Hills). Leaving the Ingwâvuma River to the west, we passed the Pongolo. As these rivers and the intervening country have lately been claimed by the Government of the South African Republic, I shall describe the district to the best of my ability. It is well watered, and, to within 30 miles of the Bomba, healthy; it is well suited for cattle, and on the higher lands for horses and sheep. The soil is generally red clay, but in the lowlands is rich; the natives reap good crops of sorghum, sweet potatoes, &c.

The country within 30 miles of the Bomba Hills is flat and bushy, abounds in Tsetse-fly and game, and is unhealthy, and therefore thinly inhabited. The Bomba Hills are inhabited along their summits, and are composed of sandstone with a species of blue granite or whinstone, lying on the top in round red stones, which, when broken, display one or other tint. On the eastern side of the range it is extremely unhealthy, inclined to be marshy, and there also the Tsetse-fly abounds.

On this side of the hills the Ingwavuma River joins the Pongolo, which then discharges itself into the Usutu, and forms what is improperly called the Mapoota River, that flows into Delagoa Bay on its southern side.

The country claimed by the Republic extends down the Umkomogazi up to its passage through the Bomba Hills, along that range southwards (the boundary of the Amaswazi) to the Usutu, and down one mile on each side of the Mapoota to the sea, up the Pongolo River, and along it to the Bivaan River. From the Bivaan to Rorkes, in Natal, was proclaimed as annexed about the year 1858, but was not occupied by the Boers. On reference to the map, this annexation will be easily traced in the Amaswazi, the Amatonga, and the Amazulu countries, between the frontier of Natal and Delagoa Bay. The Mapoota River is navigable only some 30 miles up, to within a few miles of the junction of the Usutu and Pongolo.

Little further is left to be told, except that I had bad attacks of liver-complaint, and grew excessively weak for want of nourishing food after the attack of fever. I passed the Bivaan River, the head-waters of the Umvoloose River, and the Blood River, below Utrecht, and after crossing the Buffalo River again set my foot in Natal. I purchased a horse, and with some pain and difficulty, and with the assistance of friends' carriages, reached Pietermaritzburg. My weight, on arrival, was 9 stone 3 lbs.; six weeks afterwards I weighed 11 stone 5 lbs., being a stone over my usual weight. I had so changed, from the hardships suffered and from the yellowness of my skin and the hollowness of my eyes, that my own father and sister did not know me. My friends assert that I was light-headed. I am now in good health, but extremely stout.

The result of my examination of the country to the north and north-east of Natal is, that in that vast tract of excellent land—many times larger than Natal or England—there are a great many parts fertile and healthy for man and beast, and which can now hardly be said to be peopled at all. The fly would be no barrier to the settlement of this district, as it would most likely disappear before civilization and probably with the game; there are no powerful tribes, nor, indeed, any native residents who would seriously oppose the gradual occupation of the country by white men. The country would, in all probability, be reached with facility either from Delagoa Bay or Inhambane, and it is generally healthy to within

150 miles of the coast. The former route is now being surveyed by my brother Townsend for the Glasgow and South African Company, with the view of opening up the lands for them on the western borders of the Amaswazi. It is extremely desirable that the country between the Limpopo and the U'Sabia River, and the course of the latter to its mouth, should be explored, as there is reason to suppose that it may be navigable. This is the country which is described by old geographical writers as the land of Sofala (or Ophir) and Monomotapa, and as being very rich in gold: the quantity of gold exported thence in former days by the Portuguese is stated to have amounted to millions annually, and large and wealthy cities are described as having existed there.

Ill news flies apace. An officious person had ridden in from the northern frontier of the colony with the intelligence that I had been picked up, by a Boer, lying on my blanket, in the veldt nearly dead, beyond Zoutpansberg, and my father was about to start in search of me, when I walked into his room. He did not recognise me, and thought I was a bird of ill omen arrived to confirm his forebodings of evil. All is well that ends well. But, though quite willing to undertake a similar expedition for a similar purpose, I would never do so unless properly equipped. I made two grand mistakes on this occasion: the first, in going without sufficient goods for presents and barter; the second, in travelling in the character of an explorer instead of in that of a trader. Had I gone as the latter, I should have had no trouble with the natives. The one great advantage I possessed was that I had plenty of medicine; without which this we might all have remained with our poor friend Wood.

My younger brother is so far from being discouraged by my adventures that he is anxious to start at once on a sporting trip in my footsteps, accompanied by donkeys only, which are the best companions a man can have on the Limpopo. I am now a sleek Treasury clerk again, thinking more of tare and tret than of latitude and longitude; but, like Sinbad the Sailor and Robinson Crusoe, I think it likely that the spirit of wandering is only laid, not exorcised; and that if my services are again required in the cause of science, they will be again at the disposal of the Royal Geographical Society, at whose instigation I undertook the discovery of the sources of the Limpopo, Bembe, or Spirito Sancto River.

APPENDIX I.

Mr. Erskine's Itinerary from Leydenburg to the Mouth of the Limpopo.

Place.		Date.		Time.			Rate in Statute Miles per Hour.	Magnetic Direction.	Variation of Compass.	Miles Traversed.	Remarks.
From	To	Day of Week.	Month.	From	To	Total.					
Leydenburg, 25° 4' S. lat., 31° 30' E. long.	. .	Tuesday .	1868. June 30	1·15 A.M.	3·40 P.M.	2·25	4	E.N.E.	24° W.	9	Crossed Speck Boom River, flowing W., 3·40.
	Schoeman's	,,	,, ,,	4·25 P.M.	6·25	2·0	4	N.E.	,,	8	Succession of mountains, bordering path, covered with birch.
Schoeman's Farm . .	River Umchlasingwana	Wednesday	July 1	6·25 P.M.	8·0	1·35	3½	E. by N.	,,	7	
				11 A.M.	11·45 A.M.	12·45	4	E.	,,	3	
		,,	,, ,,	11·45	1·15 P.M.	2·30	4	N.	,,	10	At 11·45 crossed rivulet.
				4 P.M.	6·0	2·0	4	E.N.E.	,,	8	Umchlasingwana flowing N., at 1·15 crossed a stream flowing W.
Umchlasingwana River .	,,	Thursday .	,, 2	12·50 P.M.	2·45	2·55	3½	E.N.E.	,,	12	Passed through Origstaad at 1·30; river flowing E. 1·20.
		,,	,, ,,	2·45 P.M.	4·15 P.M.	1·30	3½	N.E., a little easterly.	,,	6	Passed river 4·15, flowing W.
		Friday .	,, 3	8 A.M.	11·15 A.M.	3·15	3	E.	,,	9	Crossed Umchlasingwana at 10, and stopped on W. side with wagon, but crossed to other side to Trigardt's house.
		Stayed at Trigardt's from 4th to 12th July, 1869.									
Trigardt's, lat. 24° 2' S. .	Foot of Berg	Monday .	July 13	11·5	12 5	1·0	3	N.E.	22 W.	3	Crossed River Umchlasingwana at 11·30, 11·45, 12·5, and 12·30, and small stream into above from W. at 2·25.
				12·5	2·30	2·25	3	E.	,,	..	
Foot of Berg	Top of Berg	Tuesday .	,, 14	8·55	9·40	0·45	2½	E.N.E.	,,	2	At 8·55 crossed stream (same as above into river from W.) twice; at 9·25 crossed another minute stream into river from W.
				9·40	11·40	2·0	2	E. by S.	,,	4	At 10·40 crossed small stream from W.; at 11·40 another and another.

MR. ERSKINE'S ITINERARY FROM LEYDENBURG TO THE MOUTH OF THE LIMPOPO—*continued*.

PLACE.		DATE.		TIME.			Rate in Statute Miles per Hour.	Magnetic Direction.	Variation of Compass.	Miles Traversed.	REMARKS.
From	To	Day of Week.	Month.	From	To	Total.					
Foot of Berg	Top of Berg	Tuesday .	1868. July 14	1·20	2·55	1·35	2½	E. by N.	22° W.	3½	At 9·25 began ascending steep hills (1000 feet), and since 10 going along high level, Umchlasingwana River flowing in deep gorge to the right (E.) with high and precipitous banks, very high hills to E. across the valley, summit of Quathlamba district about 10 miles, valley of Umchlasi River below them. These hills, called Mosingwana, because inhabited by Chief of that name.
Top of Berg	Imperani's Kraal . .	Wednesday	,, 15	9·50 A.M.	10·50 A.M.	1·0	2	E.	,,	2	At 10 o'clock began descending the berg by "The Giant Stairs," about 1500 feet sheer drop. At 1 o'clock crossed Umchlasi River, of which Umchlasingwana is an affluent flowing N.; crossed dry watercourses at 5·10, 5·30, 6 20 P.M.; stop at Imperani's Kraal at 7 o'clock.
				10·50	1 P.M.	2·10	2	E.N.E.	,,	2	
				4·35 P.M.	7	2·25	3½	N.E.	,,	9	
Imperani's Kraal . . .	. .	Thursday	,, 16	Stayed here.						13	
Imperani's Water-hole .	. .	Friday .	,, 17	8·45	9·25	0·40	3	E.	,,	2	Water flowing N. at starting (stagnant).
				9·25	11·35	2·10	3	E.N.E. by N.	,,	6¼	Water at 10·10 flowing N. under land, kraal at 11·35, 1·5 watercourse dry, 2·15 water-hole.
				1·5	2·15	1·10	3	,,	,,	3½	
Water-hole, an affluent of Sorghobiti.	. .	Saturday .	,, 18	8·20	12·0	3·40	3	E.	,,	11	9·5 dry watercourse flowing N.
				12·30	3·5	2·35	3	E.	,,	8	9·50 watercourse, water under land, flowing N. River Umtaseera or Umtasiti at 10 o'clock, running N.E. by E. into Lipalule, dry course 11·15 (N.), water under land at 3·5, flowing N.E.
Affluent of Sorghobiti .	Sorghobiti River . .	Sunday .	,, 19	7·55	10·35	2·40	2¼	E.	,,	8	Dry watercourse 8·40, 9·15, 10 15. Water in large course

									,,		sandy bed, water in pools and under land.
Imbabati River . . .	River-bed below Imbonduna's	Wednesday	,, 22	7·40 9·40 1·0	9·15 12·5 3·40	1·25 2·25 2·40	3 3 3	E.S.E. E. E.	,, ,, ,,	3½ 7 8	Stream flowing N. at 8 o'clock. Water 12·5 running S. *Open Forest* (in contradistinction to "*Open Bush*," which has hitherto prevailed) about water at 12·5, and beyond, until stopping, river has rocky bed, dry, except in a few places. Slight rise, say 150 feet just over the other side, I conclude, the "Bomba Mountains."
Dry torrent below Imbonduna's, lat. of 23° 27'.	Imbonduna's Kraal . .	Thursday .	,, 23	3 P.M.	4·35	1·35	3	E. by S.	,,	4¾	Kraals at 3·30—4 o'clock. Ascent of about 150, and spring at 4·30. I conclude that this rise is the continuation of the Li Bomba Hills, which in evidently is the direction southwards of "Mate's Kraal," which is on a good sized hill, by MacLachlan's account, and the same as hit off by ourselves on the return journey some days before we reached the Sabi River.
Stayed at Imbonduna's until Sunday, July 26th.											
Imbonduna's Kraal . .	Imbeitse River . . .	Monday .	,, 27	8·35 1·30	1·30 4·0	4·55 2·30	3 3	S.E. by E. S.E. by S.	,, ,,	12½ 7½	Spring at 9·55. River Imbeitse trending S.S.E., stagnant; at 3·15, until stopping, did not cross. Heavy forest and banyan-trees occasionally.
Imbeitse River . . .	Oliphant's, or Lipalule, and Imbeitse's embouchure into Oliphant's River.	Tuesday .	,, 28	7·25 10·0	11·35 5·0	4·10 4·0	3 3	E.S.E. ,,	,, ,,	12 12	Country since kraals at 11·35 open forest. Stopped on bank of Oliphant's River, Imbeitse forming small lake, highish ground along river higher up.
Oliphant's River . . .	Limpopo, Ouri, Krokodil, Bembe, or Meti River.	Wednesday	,, 29	10·45	2·45	4·0	2½	S.E. by E.	,,	10	River Lipalule about 200 yards broad, shallow, about up to the chest in the deepest places, thickly inhabited. "The Meeting of the Waters" is at this point, the Oliphant's River being somewhat smaller and shallower than the Limpopo.
Stayed here until Thursday, observed for latitude 23° 34' 36" S., and longitude about 33° 40' E.											

MR. ERSKINE'S ITINERARY FROM LEYDENBURG TO THE MOUTH OF THE LIMPOPO—*continued.*

PLACE.		DATE.		TIME.			Rate in Statute Miles per Hour.	True Direction.	Variation of Compass.	Miles Traversed.	REMARKS.
From	To	Day of Week.	Month.	From	To	Total.					
			1868.								
	Stayed at confluence of rivers from arrival on July 29 until Aug. 9.										
"Meeting of Waters" .	Along side of Bembe or Limpopo.	Sunday .	Aug. 9	11·25	12·10	0·45	3	E. by S.	22° W.	2	12·10 reached side of Lifugwie Lake, about 3 miles from Bembe.
				12·10	2·10	2·0	3	S. by W.	,,	6	Kraals at 1·10, 2·10.
				2·10	3·20	1·10	2	S. by E.	,,	2	Kraals at 3·20 on rise of about 100 feet, Bembe distant half a mile, this rise continuation of that bordering northern bank of Lifugwie Lake.
Kraals on rise	Injobo's Kraal . . .	Monday .	,, 10	7·5	8·30	1·25	3	S.S E.	,,	4	3·20, stopping.
				8·30	9·15	1·45	3	S.W. by W.	,,	5	
				10·15	11·45	1·30	3	,,	,,	5	
				12·35	2·10	1·45	3	S.E.	,,	5	11·45 kraal.
				2·10	4·55	2·45	3	S.E. by S.	,,	8	11·45 river bearing S.S.E.
Injobo's	Inculuwane Spring . .	Tuesday .	,, 11	7·55	4·30	9·35	3	S. by E.	,,	28	Kraals all along route flowing at 9·50. Kraals 11·5, at which are goats. 4·10 water-hole, say 4 miles from Bembe, and spring called Inculuwane, source of Benjane River flowing towards Bembe S.S.E. Stop at Matonse Kraal, where they have about 20 cows, the first cattle since leaving Leydenburg.
Inculnwane	Umhamba	Wednesday	,, 12	9·10	10·25	1·15	3	S.E.	,,	4	Cross Benjane soon after start.
				10·25	12·15	1·45	3	S.E by S., a little E.	,,	5	9·30 cross again, kraals all along.
				1·40	4·40	3·0	3	,,	,,	9	Saw first vegetable-ivory trees. 1·50 crossed Benjane again. Struck Bembe 4·10, about 100 yards broad. Stop at Umhamba's Kraal.
Umhamba	Manjobo	Thursday .	,, 13	10·30	1·25	2·55	3	S., a little W.	,,	8	Country, hitherto bush-covered, assumes open grassy

											down, and from Injobo's to Umlanjane's Aug. 19th, 3·30, rate 2½, true direction S.W. by S.; return to Manjobo's 21st Aug.
Manjobo's	Umgy's	Saturday .	,, 23	10·0	5·20	7·20	2	S.W. by S.	,,	15	Wandering greatly, following sinuosity of river, having no guide. Cross to S. side at 5·20. At 3 o'clock Bembe trending S., and turns at ·30 to E.N.E. by N. for about 6 miles, kraals all along route.
Umgy's	Opposite to Siduda's Kraal on S. bank of River.	Sunday .	,, ,,	9·15	2·35	5·20	2	S.S.W.	,,	11	1 o'clock reached stagnant water, apparently old river-bed. Wandering along sinuosity of river.
	Returned, &c., from Aug. 24 until Aug. 31, when I again arrive at Manjobo's.										
Manjobo's	Kraal at N. end of bend referred to above.	Tuesday .	Sept. 1	12·10	6·5	5·55	2	S.S.E. for 9 miles, and then to kraal S.W.	,,	12	At 3·50 arrive at northern end of bend referred to. Stream Shogonene into Bembe at N of bend, and Shohozole running stream at 6·5.
Kraal, as above . . .	Siduda	Wednesday	,, 2	7·15	10·50	3·45	2	S.W.	,,	7	10·10 Pond "Inyama Turning."
Siduda	Ising-fungatana on S. side of Bembe or Meti.	Thursday .	,, 3	9·15	12·0	2·45	2	,,	,,	6	At 10 o'clock river bends E.N.E. 4 miles, until approaching Umtshan-tshan Hills within 4 miles, then direct line to mouth S.W., distant about 15 miles, appearance of passage through hills, as if they were snow-capped, from the dazzling sand, I afterwards ascertained. (Friday 4th) stream into Bembe at 10·30 from N., and at 10·40 skirting marsh since 11·40, until sea-shore, about 5 miles broad and 2 long on each side of river passed, chains of fresh-water lakes from 12 o'clock to 4 o'clock. Sept. 5, Saturday, reached mouth of Krokodil, Limpopo, Bembe, or Meti River, lat. 25° 15' 9" S., about long. 33° 40' E.
				12·0	2·0	2·0	2	,,	,,	4	
				2·0	3·30	1·30	2	,,	,,	3	
Ising-fungatana . . .	Sea-shore	Friday .	,, 4	9·25	10·40	1·15	2	S.E.	,,	3 Very tortuous.	
				11·40	12·0	0·20	2	S.	,,	4	
				12·0	1·30	1·30	2	S.W.	,,	3½	
				1·30	4·0	2·10	2	,,	,,	4	
	Along shore	. .	. .	4·0	5·30	1·30	2	W. by S.	,,	3	
Along shore	. . . . .	Saturday .	,, 5	7·15	8·30	1·15	2	W.	,,	2½	
				9·0	10·30	1·30	2	,,	..	3	

APPENDIX II.

Abstract of Mr. St. Vincent Erskine's Observations for Latitude, Longitude, and Magnetic Bearings.[*]

Leydenburg, Transvaal Republic.

June 26, 1868.—Altitude of Sun—with Mercurial horizon under cover.

	h.	′	″			°	′	″
2nd Set	1	25	12	..	Altitude	71	2	15
	1	29	55	..	„	70	12	10
	1	31	0	..	„	69	44	30
1st Set	1	9	20	..	„	74	17	0
	1	12	9	..	„	73	44	20
	1	14	38	..	„	73	14	35

Result deduced .. 25° 3′ 3″ S. Latitude.

June 19, 1868.—By Meridian Altitude of Sun's Lower Limb.

Devoid of Index Error .. .. .. 82° 54′ 20″

Result deduced .. 25° 4′ 41″ S.

Trigardt's Farm, Elands Berg.

July 11, 1868.—Meridian Altitude of Sun's Lower Limb 87° 17′ 50″

Result deduced .. 20° 2′ 19″ S. Lat.

Confluence of Limpopo and Lipalule.

August 1, 1868.—Meridian Altitude of Sun—Images overlapping rising. 96° 29′ 55″

Result deduced .. 23° 34′ 36″ S. Latitude.

July 30, 1868.—Double Altitude of Sun.

	h.	′	″			°	′	″
1st Observation	10	45	32	..	Altitude	92	28	0
„	10	49	57	..	„	92	36	30
2nd Observation	10	54	45	..	„	93	18	10
„	10	56	51	..	„	95	26	25

Result deduced .. 23° 50′ S. Latitude.

Umlanjane's Kraal on Bembe River.

August 27, 1868.—Altitude of Sun.

h.	′	″			°	′	″
12	40	14	..	Altitude	110	48	50
12	41	15	..	„	110	49	50
12	42	26	..	„	110	50	30

Result deduced .. 24° S. Latitude.

Meridian Altitude of Sun—Images separating rising, 110° 52′ 0″

Result deduced .. 24° 24′ 30″ S. Latitude.

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[*] Supplied by Dr. R. J. Mann.

Manjobo's Kraal on Bembe River.

August 15, 1868.—Sun's Altitude.
Meridian sets—Images separating Rising .. 102° 15′ 15″
Result deduced .. 24° 41′ 42″ S. Lat.
Aug. 16. Meridian sets—Images separating Rising 102° 55′ 16″
Result deduced .. 24° 41′ 23″ S. Lat.

Mouth of the Limpopo.

Sept. 5, 1868.—Reduction to Meridian. Back observation with sea horizon, from the land, height of eye about 8 feet.
Error of watch 40′.
Nearest Limb of Sun to Southern Point.

h.	′	″		°	′	″
12	36	35	Altitude of image, overlapping Rising from North	121	41	40
12	39	14	” ” ”	121	39	20
12	41	42	” ” ”	121	38	0

Result deduced .. 25° 15′ 29″ S. Lat.
Meridian Altitude—rising, overlapping the horizon North.
121° 36′ 20″
Result deduced .. 25° 16′ 9″ S. Latitude.

By Troughton and Simms' sextant of date 1849, reading off to 10″—large artificial horizon.

OBSERVATIONS FOR LONGITUDE BY LUNAR DISTANCES.

Leydenburg.

June 26 1868.—*Sun* W. of *Moon.*

h.	′	″			°	′	″
1	38	12,	P.M.	Altitude of Sun's limb	69	6	0
1	44	27	”	Altitude of Moon's centre.. ..	63	2	0
1	51	41	”	Distance of nearest limb	80	26	0
1	53	44	”	” ”	80	27	10
1	55	20		” ”	80	27	50
1	59	59	”	Altitude of Moon's centre.. ..	69	47	30
2	6	14	”	Altitude of Sun's limb	61	48	20

For Time.

h.	′	″			°	′	″
1	25	12,	P.M.	Altitude of Sun's limb	71	02	15
1	29	55	”	” ”	70	12	10
1	31	0	”	” ”	69	44	30

Result deduced .. 31° 31′ E. Longitude.

Confluence of the Limpopo and Lipalule.

August 3, 1868.—Planet *Saturn* W. of *Moon.*

h.	′	″		°	′	″
8	18	19	Altitude of Saturn	115	2	0
8	24	22	Altitude of Moon	94	6	0
8	29	1	Distance of nearest limb	76	14	10
8	31	24	” ”	76	15	20
8	35	34	” ”	76	16	40
8	39	3	Altitude of Moon	101	7	40
8	43	57	Altitude of Saturn	103	13	0

For Time.

h.	′	″		°	′	″
8	9	51	Altitude of Spica Virginis	45	26	30
8	12	45	„ „	44	10	50
8	14	47	„ „	43	4	45

For half the observed Angle.

Images of Moon constantly rising.

Confluence of the Limpopo and Lipalule.

August 4, 1868.—*Jupiter* E. of *Moon.*

h.	′	″			°	′	″
2	6	50	A.M.	Altitude of Jupiter	121	14	0
2	12	3	„	Altitude of Moon's limb	107	24	0
2	16	32	„	Distance of nearest limb	44	33	40
2	19	41	„	„ „	44	32	20
2	22	48	„	„ „	44	31	0
2	26	52	„	Altitude of Moon's limb	100	51	55
2	30	51	„	Altitude of Jupiter	123	13	10

For Time.

h.	′	″			°	′	″
2	33	42	„	Altitude of Jupiter	123	15	55
2	35	23	„	„ „	123	18	10
2	37	27	„	„ „	123	19	10

Confluence of the Limpopo and Lipalule.

July 30, 1868.—*Spica Virginis* W. of *Moon.*

h.	′	″		°	′	″
10	38	34	Altitude of Moon	119	21	10
10	42	23	Distance of nearest limb	28	33	10
10	45	31	„ „	28	34	20
10	47	46	„ „	28	35	30
10	51	39	Altitude of Moon	113	33	5

For Time.

h.	′	″		°	′	″
8	42	57	Altitutude of Spica Virginis	71	8	0
8	45	56	„ „	69	25	40
8	49	1	„ „	67	54	40

Confluence of the Limpopo and Lipalule.

August 1, 1868.—*Spica Virginis* W. of *Moon.*

h.	′	″		°	′	″
6	54	20	Altitude of Spica	112	40	40
6	57	40	Altitude of Moon	70	43	0
7	2	38	Distance of nearest limb	88	36	30
7	7	29	„ „	88	38	0
7	9	5	„ „	88	39	10
7	12	38	Altitude of Moon	77	21	40
7	19	19	Altitude of Spica	101	37	20

For Time.

h.	′	″		°	′	″
7	22	59	Altitude of Spica	99	58	50
7	27	13	„ „	98	5	50
7	29	27	„ „	96	59	40

August 2, 1868.—For Approximate Longitude.

h.	′	″		°	′	″
11	19	52	Altitude of Moon	96	56	0
11	20	20	„ „	96	54	40
11	22	6	„ „	96	51	20

Umhamba's Kraal on Bembe River, 12 miles N.W. of Manjobo's Kraal, 38 miles S.E. of Confluence, probably about long. 34° *E., lat.* 24° 30′ *S.*

Sun E. of *Moon.*

h.	′	″		°	′	″
7	49	16	Altitude of Sun's upper limb	48	44	25
7	52	25	Altitude of Moon's upper limb	79	58	15
7	56	10	Distance of nearest limb	80	48	5
7	58	16	„ „	80	37	30
8	0	19	„ „	80	36	0
8	3	14	Altitude of Moon's upper limb	76	42	50
8	6	25	Altitude of Moon's upper limb	49	18	40

For Time.

h.	′	″		°	′	″
8	15	27	Altitude of Sun's lower limb	58	42	30
8	20	41	„ „	60	40	30
8	24	19	„ „	61	58	10

Umhamba's Kraal.

August 13, 1868.—*Sun* E. of *Moon.*

h.	′	″		°	′	″
7	34	50	Altitude of Sun's upper limb overlapping rising	46	20	20
7	43	0	Altitude of Moon's upper limb separating setting	89	23	50
7	47	19	Distance of nearest limb	67	53	05
7	50	7	„ „	67	52	45
7	52	53	„ „	67	51	10
8	0	54	Altitude of Moon's upper limb separating setting	85	59	10
8	7	25	Altitude of Sun's upper limb overlapping rising	57	20	3

For Time.

h.	′	″		°	′	″
8	7	25	Altitude of Sun's upper limb overlapping rising	57	20	30
8	9	15	„ „	58	1	10
8	11	45	„ „	59	58	20

Umhamba's Kraal.

August 13, Second set. *Sun* E. of *Moon.*

h.	′	″		°	′	″
8	17	53	Altitude of upper limb of Sun overlapping rising	61	6	0
8	21	25	Altitude of Moon's upper limb separating setting	81	15	10
8	25	19	Distance of nearest limb	67	41	20
8	27	50	„ „	67	40	20
8	29	12	„ „	67	39	55
8	33	30	Altitude of Moon's upper limb separating setting	78	7	40
8	38	33	Altitude of Sun's upper limb overlapping rising	68	39	50

For Time.

h.	′	″		°	′	″
8	41	36	Altitude separating rising	68	39	55
8	43	58	„ „	69	29	50
8	45	37	„ „	70	3	5

Instrument, Troughton and Simms' large sextant, reading off to 10″—with artificial horizon with roof.

OBSERVATIONS FOR VARIATION OF COMPASS.

Leydenberg, 24° W.

Trigardt's Farm.

July 12. Mean of 3 observations .. N. 43° 30′ East.
Result deduced .. 20° W. nearly.

On Sorghobiti River. Lat. 23° S., Long. 33° E.

July 20, 1868.—Observed amplitude. Rising E. 1° N.
„ Setting W. 45° 5 N.
Result deduced .. 22° 2′ W.

Confluence of the Limpopo and Lipalule.

July 30, 1868.—Amplitude at setting W. 43° N.
July 31, 1868.—Amplitude at rising, N. 91° 30′ E.
Result deduced .. 22° W.

Umhamba's Kraal on Bembe River.

Aug. 12, 1868.—8^{h} 20′ A.M., Mean of 3 altitudes of Sun, 30° 13′ 32″
Compass bearing, N. 74° 30′ E.
Instrument, Troughton's pocket prismatic compass.

XII.—*On the Physical Geography and Natural Resources of Epirus.* By MAJOR R. STUART, H.M. Consul at Yanina.

THE province of Epirus is situated on that part of the Eastern shore of the Adriatic where the coast line, deflecting from the general direction of the land, approaches to within 44 statute miles of the back of the heel of Italy, with which it forms the gates, as it were, of the Adriatic. It lies between 38° 56′ and 41° 6′ N. latitude, and 19° 16′ and 21° 35′ E. longitude, being 158 miles long from N.W. to S.E.; its greatest breadth is 65 miles, its least about 50, and its superficial area may be stated at about 8000 square miles. It is bounded on the N. by North Albania, on the E. by Macedonia and a part of Mount Pindus, on the S. by the Gulf of Arta and Greece, and on the W. by the Adriatic and the Canal of Corfu. It has a coast line, including bends and irregularities, of 370 miles, viz., 320 on the seaboard, and 50 on the Gulfs of Prevesa and Arta. From the northern extremity, for a direct distance of about 40 miles, the shore is flat and marshy, with extensive salines; and for about 15 miles the land at the southern end is low and shelving; the intermediate part presents a bold and inhospitable coast, formed chiefly by the abrupt flank of the lowest fall of Mount Pindus, pierced, however, by several bays, which

Here also

fall of Mo

penetrate either into the openings of transverse valleys or between the extremities of inosculating heights.

THE COAST.

On the north the first harbour is the Bay of Avlona, or, according to the Italians, Valona, a name which may, I think, be derived from the ancient City of Apollonia, which was situated about 15 miles to the north, a short distance from the right bank of the Viossa. The Bay of Avlona is about 10 miles long and 4 in average breadth; it opens to the N.W.; and the rocky Islet of Sasseno, 3 miles long, a mile broad, and 1000 feet high, forms a partial breakwater, with a navigable channel and deep water at either end. Within the bay the soundings vary from 10 to 30 fathoms, and the bottom is everywhere composed of a tenacious mud, the detritus from the surrounding mountains. The bay is separated from the Adriatic by a rocky promontory, which forms the extremity of the Acroceraunian range, and terminates in a point 2290 feet high. This point is marked on some charts and maps as Cape Linguetta, the Italian of its ancient name of Glossa, by which locally it is still better known.

The present port-town bears the name of the bay, Avlona. It is situated 1½ mile inland, at the base of an amphitheatre of clustering heights. The ancient port-town was Oricum, at the bottom of the bay, where some scattered ruins, called Erico, still attest its site and name.

From Cape Linguetta, or Glossa, to Point Palermo, a direct distance of 39⅓ miles, there is a line of coast which has ever been dreaded as a lee-shore. The term "infames scopuli," applied to it by Horace, is no libel. It is the sea front of the Acroceraunian cluster, which, rising in serrated heights, culminates in Mount Chica, 6300 feet high. The coast range, which is the continuation of Cape Linguetta, is called Longarra; and between it and Mount Chica is a valley, which towards the S., where it gradually narrows, has been filled up by mountain detritus and débris. This part is called "Khimarra," the Greek for "winter torrent," a name which has been aptly given to a district deeply grooved with eroded gorges, through which the collected rains of the mountain are wont to rush with impetuous violence to the sea.

Ascending from the valley between the ranges of Longarra and Chika, one enters Khimarra by a narrow plateau called "Kiafé" (head) which overlooks the sea, and being exposed to the north, south, and west winds, is always approached with apprehension, for sudden squalls in all seasons sweep over it with a force which neither man nor horse can withstand. Here also electric clouds are frequently arrested in their course, and discharge their contents with an effect which shows that the name of Acroceraunia ("thunderbolt-point") is no poetic fancy. I was near the spot when an electric storm broke over it; and never before did I hear discharges so loud, or see such vivid flashes. The thunder seemed to fill the atmosphere, the lightning to illuminate it; I felt as if I were in the midst of the noise and of the blaze, which stunned my ears and dazzled my eyes. The inhabitants dread these storms, which are often destructive to life and property. As a provision in some degree against them, and at the same time against earthquakes, they build their houses and premises in dry masonry, so that the walls, which must be solid to resist the winds, may, if struck, be but partially damaged, and, if shaken, may in some measure yield to the oscillation. It is for this latter reason that horizontal binders (as they are called) of wood, are generally inserted between the courses of mortar masonry in this country, at intervals of 2 or 3 feet. They diminish the rigidity of the building, and the pliancy thus imparted to it is some security against the effects of earthquakes.

Of the minor indentations which break this line of coast, Palasa alone deserves mention, and this from the fact that it was here that Cæsar landed the forces with which he proceeded against Pompey in Illyria, and subsequently defeated him at Pharsala.

Port Palermo is the only port deserving the name on the Acroceraunian coast. It is 1½ mile long by ¾ mile broad, and has deep water in-shore. The soundings vary from 10 to 40 fathoms, with a mud bottom. It is open to the S.W., with an entrance ¾ mile wide. Between the flanking promontories, named respectively Kavadoní on the north, and Palermo on the south, a little rocky projection within the port forms a natural mole and partial breakwater; under its lee there is secure anchorage in all weathers.

Khimarra has seldom been visited by travellers, and the published descriptions of it have for the most part been taken from its sea aspect, which is stern and forbidding. Such, however, is not the character of this strip of country; it is, on the contrary, fertile, highly cultivated and well peopled. The soil consists of limestone detritus washed down from the impending heights, and eminently suits the olive and the vine, produces abundant crops of rye and barley, and affords excellent pasture for sheep and cattle. The district contains 12 villages, or rather small towns, of which Khimarra is the chief; they all present an air of comfort and prosperity, and the inhabitants are as a rule hale, handsome, and well-grown. Owing to certain prescriptive immunities, the Khimarriotes are but little interfered with by the Imperial Government; each village has consequently become the centre of a little quasi-independent republic, and as the people are all of naturally enterprising habits, their name is known along the shores of the Adriatic in creditable connection with industry and commerce. Their commercial intercourse with other countries, combined with home education, has produced an effect on their social and intellectual character strongly contrasting with their local isolation.

The Longarra range terminates at Point Palermo, thence to Cape Kefāli, 8 miles, a low coast extends to the foot of the inner range, and through its shingly edge several rivulets force their way into the sea. From Cape Kefāli to Santi Quaranta Bay there are 5 miles of mountain headland, which, parallel to the opposite coast of Corfu, forms with it the N. channel, here 6 miles wide, but narrowing farther in to 1½ mile, the nearest approach of the island to the mainland. That union once existed between these parts, may, I think, be surmised from the conformation of the land on both sides of the Channel, and from the identity of the mountain strikes; the fractured ridges, if produced, would meet, and geologically they are of uniform character.

Entering the N. channel, the first place for shipping on the mainland is the bay of Santi Quaranta, so called from a monastery which was dedicated to some company of forty martyrs, who have been canonised by the Eastern Church. The monastery stood on a neighbouring height; but nothing of it now remains but the chapel, which is in ruins.

The bay is exposed to the west wind, and in part to the northwest, and the shore shelves rapidly into deep water; but though at times unsafe, the bay is much frequented by coasting craft, as being the only outlet for the fertile district of Delvino, and even of Arghyrocastro, which is 10 miles farther inland. A few humble buildings now serve for the commercial and other requirements of Santi Quaranta; but it is not from its present condition that the place derives its interest; a comparison of historic notices and the silent testimony of ruins assign to it a long-sustained importance in past ages, identifying it as the site of the ancient city of Onchesmus, which was the point of departure from Epirus to Italy, and which even gave its name to the south-east wind, which was favourable to the passage. Of this ancient city there are no visible remains; it was, no doubt, included in the general destruction which the Romans inflicted on Epirus; and the materials as well as the site were used in the construction of a Byzantine city, the ruins of which still mark the spot. Onchesmus is a Greek word, which signifies, with other meanings, "sailing;" but the Byzantine city was called Anchiasmus, either in ignorance of the etymology of the old name, or from an affected veneration for a mythic story which connected the spot with the name of Anchises. When this city was built is unknown; it was a bishopric in the fifth century, and is supposed to have been destroyed by the Goths in 552.

From Santi Quaranta to Butrinto Bay the direct distance is about 8 miles, and the intervening coast is rugged and precipitous. Butrinto Bay is muddy, and is shallow in-shore from the deposit of the river of the same name; which deposit is gradually forming marshy land, and has already converted into a lagoon what was anciently a rock-girt harbour on the right of the river and close to its mouth.

The drainage of the plain of Delvino, collected into a deep hollow between the maritime and an inner range, forms the Lake of Butrinto, which is 4 miles long, 1½ mile in average width, and 12 fathoms in the deepest part. Its waters are discharged through a natural canal, the Butrinto River just mentioned, which is 2½ miles long, from 40 to 50 feet wide, and from 12 to 18 feet deep; there is a bar at its mouth which renders it difficult of entrance; the current is sluggish, and even sets inward at times whenever the level of the lake has been unusually depressed by a N. or N.E. wind.

On a rocky promontory at the S.W. corner of the lake where the waters enter the river, are the ruins of the ancient city of Bouthrotum; they are contained within an inclosure of about a mile in circumference, and are a mixture of Pelasgic, Hellenic, Roman, Gothic, and Venetian work, with remnants of Pagan temples and Christian churches. Proof is thus given of the high estimation in which this position was held through a long series of ages, and by the different races that successively held the coast. A brief description of the place will account for the value attached to it. The ancient name (from Βοῦςθρώτυω) plainly refers to the exportation of cattle, and shows that the animals had to *leap* as they still do into the boats of shallow draft that conveyed them over the bar. The fertile plain of Vrana, extending 5 miles to the S.E., was the pasture ground of these cattle. It is peculiarly adapted to this use, as is shown by the fact that during the British protectorate of the Ionian States, it was always rented as grazing ground by the Commissariat contractor. This plain is watered by a mountain stream which in mid-course separates into two channels, one of which leads to the bay, the other to the Lake of Butrinto, before entering which its volume of water is increased by the discharge of Lake Risa; this lake is a mile and a half long by half a mile wide, and is half a mile S.E. from Lake Butrinto; it takes its name from the rice which grows on its marshy borders; this rice, I may add, is of a coarse grain and reddish colour, similar to the cargo rice of Bengal.

The Lake of Butrinto from the frequent infusion of sea-water, as already noticed, is sufficiently saline for grey mullet; and teeming with this and other fish, it was called by the Venetians Vivari, locally corrupted into Sivari. The fish of brackish waters are generally of inferior quality: the grey mullet is an exception; and as this fish is in constant demand, its abundance in the Sivari used to confer no small value on those waters. The roe when pickled, smoke-dried, and coated with melted wax, becomes the Botarghi of Mediterranean commerce; the word botarghi is a corruption of the Greek *ὠὰ τάριχα*, "pickled eggs."

In addition to these resources of land and water, the mountains above Butrinto were covered with forests which furnished prime timber for building and naval purposes together with abundance of firewood; these forests were, as still, peopled with wild pigs, wolves, foxes, and jackals, while the adjacent plains and waters abounded with small and feathered game.

Such, in part at least, were the natural resources which, combined with position, invested Butrinto in former times with importance. But while the liberality of Nature is undiminished the aspect of the place is totally changed; the strong post and the large city are solitary ruins; the pastures are almost deserted, and fever and ague await the sportsman who would visit the place, allured by the teeming game.

It may interest the antiquary to know that in recent times no systematic researches have been made amongst the ruins of Butrinto; the same observation may, indeed, be extended to most of the ancient cities whose ruins dot the face of Epirus.

From Butrinto seven miles of rockbound coast extend to Cape Stilo, which is the extremity of a counterfort of the maritime range; and from Cape Stilo to Saïada an equal distance of similar coast, which is pierced first by the small harbour of Phtelia, next by the open port of Kataïto, and thirdly by the harbour of Pagania. The bay of Saïada is shallow, with a shelving gravelly shore of about 6 miles in circuit; it has a skala and a custom-house, and is the chief point of communication between Corfu and Janina. Fetid marshes line the shore; but further in, between the spurs of the receding mountains, there is a wide surface of fine alluvial land formed by the Kalamus (ancient Thyamis) which here falls into the sea. The bay derives its name from the village of Saïada which crowns a neighbouring height, and which in the middle ages was an important fortified town. Saïada is a corruption from the Greek *Sybota*, hog-feeding; but this place must not be confounded with the islets of the same name in the south channel, which sheltered the Corfiote fleet on the eve of its engagement with that of the Corinthians B.C. 432.

The Kalamus, 12 miles before reaching the sea, parts into two channels: the northern is evidently of recent formation; through it the river now discharges the chief part of its waters, which are forming a delta known by the name of the Bacchante flats. The old or southern branch has already formed a delta of considerable extent, and is gradually filling up the once capacious port of Livitatza.

Beyond Livitatza, and separated from it by a rocky point of the same name, is the bay of Gomenitza, a fine natural basin, 2 miles wide, nearly 3 long, and with 14 fathoms of water in the middle. The entrance, however, is crossed by a bar, projected from the alluvium of the Kalamus, on which there is only 2¼ fathoms. The name Gomenitza is the Italian word *Gomena*, a cable, with a Slavonic termination.

A high mountain spur separates the bay of Gomenitza from that of Plataria, which is 3 miles in length, 2½ wide at the entrance, narrowing to ¾ mile at the bottom, and with deep water throughout. Rounding the island point Hieronisi, we next come to the small inlet of Mourtzo and to the rocky islets of Sybota, already mentioned, which Thucydides has rendered memorable in connection with the prelude of a war which ruined Greece and opened a new chapter in the history of the world. At the nearest point these islets are only 4½ miles from Corfu. Hence there is 18 miles of rock-bound coast, which continues to protrude till it reaches Cape Varlam midway, and thence recedes to Cape Keladio, which shelters the port of Parga from the west winds. Here the coast, striking due east 4 miles, and then due south to Port Phanari about 2½ miles, presents to us scenes and places famed in mythology, history, and song; for Cape Keladion is the Khimerion of the Odyssey and Thucydides; and the united waters of the Acheron and the Cocytus, now the Phraï and the Vuvo, fall into Port Phanari, Parga being the Toryné of antiquity.

In the angle of the coast is the deep but unfrequented port of St. John; the ancient name of Port Phanari was Glykys, from the quantity of fresh water it received from the rivers of fable just mentioned; and from this port to the Straits of Prevesa, the coast presents no feature deserving special notice. For 11½ miles, as far as Point Kastrosikia, it is high and rugged; thence to Mitika Point the Bay of Gomaros slightly invades the subsiding land; and from Mitika there is a line of red cliff from 6 to

10 feet high to the point of the peninsula, 4 miles, and round to Prevesa.

Prevesa Strait is the entrance to the Gulf of Arta; it is 1¼ mile wide at the outer end, narrows to ⅓ mile in front of the town of Prevesa, thence with a slight expansion it bends ½ mile further N. into the Gulf. In the narrow the soundings vary from 40 to 80 feet; but a mile farther out there is such an accumulation of sand and gravel, that with difficulty a channel with 13 feet of water has been buoyed off. Such is the present entrance to the Gulf; but I think there are grounds for assuming that the low tongue of land on which stood the ancient Actium is an alluvial formation, and that the basin, variously called the Procolpo and the Gulf of Prevesa, was once open to the sea, which, unobstructed between Prevesa Point and Mount Konilo in Acamania, met the issuing waters of the Gulf where Capes Skafidaki and Panagia approach within a distance of 1½ mile. There is an outward current by the south and an inward, which is less perceptible, by the north.

Here all is classic; the battle of Actium was fought in the Procolpo; and the name of Royal Plain (*Campo Vasiliko*) still clings to the tongue of land just noticed, on which Antony encamped while awaiting the approach of his rival. The south and east shores of the Gulf of Arta abound in vestiges of antiquity; but they belong to Greece, and can therefore have no place in this paper. The boundary line, beginning from the N.E. angle of the Gulf, rather inclines to the north shore, passes midway between Capes Skafidaki and Panagia, divides the Procolpo equally and cuts off 2½ miles of the Campo Vasiliko, thus securing to Turkey the exclusive command of the entrance to these beautiful waters. The north shore is 16½ miles in direct length; it is low and marshy, of irregular contour, skirted in half its length with sandbanks inclosing deep lagoons, which decayed vegetation and the detritus of the Plain of Arta are slowly converting into land. There is no port on the north side, and the only place of approach for shipping is the Roadstead of Salagora which is 5 miles nearly due north from the Strait of Skafidaki. Along the north coast the water is shallow, but everywhere else in the Gulf it is deep, the soundings varying from 10 to 35 fathoms, with a bottom of tenacious mud, which affords good anchorage. A view of this fine basin cannot fail to suggest the idea of a naval and commercial station of the first order: it was such in antiquity, and its natural conditions are the same as ever; its central position, its teeming fisheries, extensive salines, the Plain of Arta, the encircling mountains clothed with forests, these and many other advantages are so many appeals to human industry and enterprise; it is not in the nature of things that such appeals should be for ever unheeded.

MOUNTAINS.

Epirus is essentially a country of mountains; it is a dependency of Mount Pindus, and more immediately of that part of it which lies between the Peak of Lakmon in N. lat. 39° 57′ and its articulation with Mount Othrys in lat. 39°. No accurate survey has ever been made of Mount Pindus or of any part of it: there are wide discrepancies in the published notations of its altitudes; and although they are in some cases given with great nicety, they must always be received under reserve as mere approximations.

Pindus is the name of the most westerly of the three main spurs which branch off from the Balkan; starting from Tchardaugh, the nucleus of the Balkan, it forms the eastern boundary of North Albania, separates Thessaly from Epirus, traverses continental Greece, and terminates in Cape Colonna. Pindus is the general name of the chain, but every conspicuous height from end to end has a special designation: it would be tedious to particularise these eminences; suffice it to say that near the Epirus frontier the most conspicuous of them is Badzikaki, on the Greek frontier, 7760 feet high, and the most celebrated is Lakmon, above mentioned, 5550 feet. These heights are given as I have premised, under reserve. I have gone somewhat out of my way in stating these few particulars, for no part of Pindus proper is in Epirus; but a twin chain, if I may use the expression, of equal altitude runs parallel to it, which, beginning in Acarnania, ends in Mount Lingon in the angle between the Viossa and its confluent the Voudhomati ("ox-eye"). The Turco-Greek frontier cuts this chain at the Peak of Furka, 6300 feet high, thence it holds due north 25 miles in an unbroken ridge, when its continuity is abruptly cut short, and a remarkable isolated height arises, which forms a striking feature in the mountain scenery of Epirus: this height is called Djumerka; it gives its name to the surrounding district, and it acquires a shadow of classic interest from the attempt to identify it with the Tomarus of Dodona. Beyond Djumerka this secondary chain attains its greatest elevation in the Peak of Kakardhista; 15 miles from this is the Peak of Tzikureli, which is separated from the terminal ridge of Lingon by the valley of the Arta River (ancient Aracthus).

The part of Pindus above described and its twin chain, kept apart by the deep narrow valley of the Aspropotamus (ancient Achelous), are set upon the intersection of the plains of Thessaly and Epirus, thus forming a double ridge which, westward, descends in successive tiers to the Adriatic. There are four of these tiers. The first, separated from the parent chain by the valley of the Arta River, begins immediately to the north of Arta; closely compressing the river, its direction is nearly due north for 45 miles, as far as Janina, where, after a deep subsidence, it bends to the N.W., and after holding this course for 70 miles, it terminates in the double-headed Trebusin, from which, however, it is severed by the deep transversal gorge of Klisoura ("the key of the mountain"), a generic name in these parts for similar defiles. This chain has names varying with the districts through which it passes. Its southern extremity is called Kilberini. Midway between Arta and Janina a semi-detached eminence stands out, nearly parallel to and forming a pair with Djumerka; this eminence is called Xerovouno ("the dry mountain"), and, as well as its higher mate, is a conspicuous landmark in the country. After Xerovouno comes Tomaro, which farther on changes to Drysco ("the little oak"). Here it is that the mountain, as noticed, subsides. At the bend it rises again and forms the double-headed peak of Mitzekeli, which overlooks the lake and city of Janina. Ten miles farther on, the line is broken and disconnected for a distance of 15 miles; after which, the mountain re-forms in two lofty ridges which, loop-shaped, meet and terminate in Trebusin. Of these ridges, the eastern is called Nemertzika, the other Vradetta; they are truncated, as has been noticed, before their junction by the Viossa, which sweeping in its upper course along the inner base of Nemertzika, thus finds a passage to the sea. This passage is 9 miles in length; and that it is not waterworn, but of violent origin, is strongly suggested by the reciprocal conformity of the salient and re-entering angles which alternate on its rocky flanks.

Although my present task is geographical, I cannot here resist the temptation of noting the historic interest of this pass. It was the Fauces Antigoneia of the Romans, so called from the neighbouring stronghold of Antigonia, now the ruined fortress of Tepeleni. It was here that Philip the last King of Macedon, when engaged in war with the Romans 198 years B.C., succeeded for a whole season in keeping his formidable enemy at bay. He intrenched himself at the western entrance of the gorge: he might have defeated all the attacks of force; he was mastered by strategy. Titus Quinctus Flaminius, newly appointed to the command of the Romans, while amusing Philip with demonstrations in front, detached a strong force, which, ascending the course of the Suftinia, a confluent that falls into the Viossa below Tepeleni, got to the back of Mount Trebusin, gained the head of the valley which separates the two summits of that mountain, and, passing through the present villages of

Arza and Mezgorani, showed itself in Philip's rear. He was outgeneralled; nor was he able by flight or valour to retrieve his discomfiture or escape his pursuing foe. It has been my privilege, Livy in hand, to study the *Stena* of Klisoura, to mark its positions, to distinguish Mount Æropus on the right bank and Asnaus on the left, and after giving its place to each of the recorded incidents of Philip's defeat, to accompany the vanquished monarch in his precipitate flight, first up the right bank of the Viossa, then across into Vella (melotis), and by Lingon to that elevated position where for a few days he reposed amid "Juga summa, campos patentes, aquasque perennes." There is no difficulty in identifying this plain with the mountain plain, now called Politza, near Lakmon.

To return from this digression; the 2nd 3rd and 4th tiers of Pindus abut on the plain of Arta, where they nearly touch. There is a second junction at Suli, about 15 miles to the north; thence on they are distant for about 20 miles, but soon begin to lose their individuality, until at length they blend into an irregular group between the lower Viossa and the Adriatic, which group extends into Albania. About 10 miles due south of Janina, No. 2 attains its greatest elevation in the pinnacled height calted Olitzika, from which it throws out a sharp ridge, that inosculates with the first tier at the point well known to travellers by the name of St. Demetri, 12 miles S.E. of Janina, cut by the Kalamus at a place called Raïko; the chain thence takes the name of Djamousi, which it retains until its distinctness is lost.

The 3rd tier, emerging from the knot at Souli, under the name of Konila, flanks to the east, the valley of the Vuvo (Cocytus). N. of Paramythia it is severed by a deep ravine from the Peak of Labanitza, beyond which it mingles in the above-mentioned group.

The 4th tier is the maritime barrier of the country; it is not a continuous ridge, but is composed of a succession of fragments in irregular échelon, the remnants of mountain chains that were broken and partly engulfed in the course of those remote changes of which Geology informs us. Thanks to Her Majesty's hydrographers, we possess the most accurate and comprehensive information of this part of the mountain-system of Epirus. Their surveys take in a strip of the coast, 3 miles wide; and all the details are so clearly given that a glance at the chart would have more effect than pages of written description. According to these charts, the maritime fragments vary in height from 850 to 1900 feet: Kiepert assigns 7800 feet to the highest part of the Thessalian Pindus; of the intervening ridges no measurement, that I am aware of, has ever been attempted. The average distance between the crest lines of the several tiers is nearly as follows:—between Pindus proper and its twin range, 15 miles; between the twin range and the first tier, 28 miles: between the 1st and 2nd, 28 miles; the 2nd and 3rd, 16 miles; the 3rd and coast range, variable. The counterslope of the 1st and 2nd tiers is the steepest; both slopes of the third are nearly equal; in the coast fragments there is no uniformity in this respect.

Between these main chains there are in some places subordinate mountain formations of varying elevation, more or less detached, and more or less conformable in the line of direction; some of them have been mapped with specific names, but in general they are called after some neighbouring monastery, church or village.

The plains and valley plains descend in steps conformably to the mountains. The first of note is the Plain of Janina, the Hellopia of antiquity, which, situated between the first tier and one of its subordinates, is 20 miles in extreme length, 16 in greatest breadth, which is at the middle, whence it tapers to the extremities. The lateral inclination of this plain is from west to east; and in the angle between mounts Drysco and Mitzekeli lies a beautiful lake, whose blue waters add to the pictorial effect and relieve the stern character of the surrounding panorama. This lake merits a few remarks. It is supposed to be the Pambotis of antiquity; it is six miles long, 3 in greatest width at the S.E., diminishing to one at the N.W.; it receives no perennial stream, but is chiefly fed by the filtrations of Mitzekeli, which gush out beneath the water-mark; for the greater part of the year its waters are limpid and wholesome to drink; but in the fall they are polluted by decomposed vegeable matter, and by the droppings of water-fowl, which at that season frequent the lake in myriads. Along the edge, where the water is shallow, the papyrus grows in abundance and equisetaceæ; the former are much used for matting, the latter for huts, sheepfolds, and weirs. The fish of the lake are the eel, which attains an enormous size, the carp, pike, tench, perch, and a small fish called Dzimé, which is said to feed on the roe of the other kinds; it is delicate for the table, and is taken with silk nets, made expressly of fine tissue; water-snakes also abound in the lake.

Towards the S.W. end a rocky islet stands out of the waters, an outlier of Mitzekeli; though only ½ mile long by ⅓ mile across, it boasts of seven monasteries, and of a village of some 200 houses, inhabited by a thrifty population, which lives chiefly by fishing, ferrying, and wood-cutting. In one of the monasteries is pointed out the room in which, 48 years ago, the famous Ali

Pasha was mastered by treachery, and the floor is still perforated with the shots that were fired at him from underneath. Facing this islet a rocky promontory projects from the plain into the lake, its front and flanks having a perpendicular height of from 70 to 80 feet. On this promontory stands the citadel of Janina; and behind it the city, which is the capital of Epirus, spreads, fan-shaped, up the slope, until stopped by the low heights of St. George.

Through a narrow canal, partly natural, partly artificial, the waters of the Lake of Janina sluggishly flow into the smaller lake of Lapsista, 6 miles to the N.W. After heavy rains the intervening lands are sometimes flooded, so that the two lakes form but one sheet of water; on the other hand, in seasons of drought there is no communication between them. These lakes have no surface outlet, but the waters of Lake Lapsista flow into a cavity of chambered limestone, and after a passage of 5 miles under a mountain ridge they reappear in a deep gorge, through which they rush into the Kalamus near Raïko.

The plain next in order is that of the Drino; it is situated 20 miles from Janina between Mount Vradetta and the second tier, is 25 miles long, and 4 miles at the head, narrowing to a deep gorge at the confluence of the Drino with the Viossa, which is near Tepeleni at the west end of the Pass of Klisura. This valley plain, fertile in olives, barley, indian corn and tobacco, supports a number of villages which dot the lower levels of the flanking mountains, and are subordinate to Arghyrocastro (ancient Hadrianopolis), which, with its castellated fort, crowns some projecting roots of the western ridge. It is the focus of the Mussulman aristocracy of Epirus, and consists of a number of large, detached mansions which, even in decay, present an imposing appearance.

The only other noteworthy valley plains of the interior, are those of the Upper Louro, called Vathee, or "the deep," and of the Upper Viossa below Konitza (ancient Eriboa). Descending towards the sea, there is first the great Plain of Musakia, which stretches northwards from Avlona, 40 miles along the coast, and varies in width from 3 miles to 30 miles. This noble plain is abundantly watered in its southern part by the rivers Viossa, Beratino, and Skombi; and, being a formation of mingled alluvium, it possesses a fertility equal to any amount, and almost to every variety of production, being equally fit for agriculture and pasture, for the stock and botany of hot and cold climates.

Separated from Musakia by the Acroceraunian Mountains, is the Plain of Delvino which, lying within the coast range, is nearly circular in shape, with a diameter of about 16 miles, and is well-watered by the streams which unite to form the lake of Butrinto. Proceeding southwards, there are fine levels about the lower Kalamus. The valley of the Vuvo (Cocytus), contains the best soil in Epirus for tobacco; it reaches to the Phraï (Acheron), and the Acherusian marsh; and the mountains of Cassopæ separate it from the splendid lands of Lamari which, with the plain of Arta, form the southern part of Epirus. Lamari may be considered the western part of the plain of Arta, which would thus be 20 miles in length and 10 miles in greatest breadth; its soil is alluvial, and it is watered by the rivers Arta (Aracthus) and Louro (Charadrus), together with countless streamlets which issue from the roots of the mountains. Some of these streams, unable to gain an outlet, form permanent marshes in different parts of the plain; but everywhere else the land is of prime quality, yielding, among other products, barley, wheat, Indian corn, tobacco, rice, and flax, to which cotton may be added. The olive flourishes on the drier levels, and near the town of Arta the orange, lemon, and citron arrive at great perfection.

The plains Musakia and Arta, leaving out the valley plains above mentioned, may be considered a compensating provision for the mountain sterility of the interior.

RIVERS.

The rivers have already been incidentally mentioned. They are, beginning from the N., the Beratino (Apsus), the Viossa (Aous), the Kalamus (Thyamis), the Louro (Charadrus), and the Arta (Aracthus). The streams Pavla and Vistritsa, which form Lake Butrinto, are too inconsiderable to be classed as rivers, and the same may be said of the confluent streams, the Vuvo and Phraï, famed though they be as the Cocytus and Acheron of poetic fable.

Of these rivers the Beratino rises on the Macedonian Pindus, and after a winding course of about 100 miles, as the arrow flies, in a direction nearly due W., it falls into the Adriatic. The Viossa rises in Mount Lakmon, its course is N.W., its length about 100 miles, and its embouchure is only 15 miles S. of that of the Beratino; its chief tributaries are the Voudhomati, the Drino, and the Polyanthes, all flowing from the S. The Kalamus rises in Vella (ancient Melotis), its course is S.S.W., intersecting the line of the lower mountain tiers, from which it receives numerous tributaries; it approaches the sea by frequent sinuosities amongst the interfering heights, and it finishes its difficult course between Saïada and Gomenitza. The Louro springs from the roots of Xerovouno, and working round the S. base of Olitzika, it flows through the valley of

Vathee, enters the narrows of St. George, where it receives the copious spring that supplied water by means of an aqueduct to the Nicopolis of Augustus Cæsar; thence, after a rapid course of about 10 miles, it emerges into the plain of Arta, and skirting the base of the mountains, it falls into the Gulf of Arta, at the N.W. angle. Its direct length is about 35 miles. The Arta river has two sources, the one in Mount Lakmon, the other in the heights between Lingon and Mitzekeli; these meet at a place called Baldouni, whence they flow in a united stream between the twin Pindus and the first tier, and after 40 miles in a direction nearly due S., the river enters the plain of Arta, through which it meanders for 7 miles to the Gulf. In former times, this river disembogued at the foot of an isolated eminence, upon which are still to be seen the ruins of an ancient fort; but at some unknown date, repelled no doubt by an obstacle of its own making, it turned to the left at a sharp angle, and worked its present channel through the heavy alluvium.

None of the rivers of Epirus are navigable; in their upper courses they are mountain torrents or rapid streams; and in their passage through the low lands, they are obstructed by shallow and shifting mud-banks, while they are all blocked at the mouth by bars and deltas. They offer, however, great water power for industrial purposes, for irrigation, and, on the plains, for canals.

Of necessity there are several watersheds in Epirus; but the chief, and one of the most remarkable in Europe, is Mount Lakmon. From its pregnant flanks spring four classic rivers, namely the Peneus, the Haliacmon (in part), the Aous, and the Aracthus: I might almost add the Achelous, which has its source a few miles S. above the village of Khaliki (anciently Chalcis). The fountain heads of the Haliacmon (rather of its branch the Venetico), of the Aous, and of the Aracthus, almost meet on the plain of Politza, supplying the perennial waters mentioned by Livy, as already noticed.

LAKES.

Except the Lakes of Janina and Butrinto, there are none of any importance in Epirus. A small lake on the plain of Vella, forms one of the heads of the Kalamus. Close to the right bank of the Louro, about 4 miles above its issue into the plain of Arta, and about 50 feet above its level, there is a small rock-girt lake of great depth; and on the truncated tops of several of the highest mountains, there are deep perennial reservoirs, which are peopled only with newts (*Triton aquaticus*).

In the droughts of summer, these reservoirs are much resorted to by shepherds when the usual supplies of water fail.

CLIMATE.

A French writer, describing the climate of Epirus, has observed with terse propriety, that it is, "un abrégé de tous les climats." On the great plains of the N. and S. it is in pretty regular conformity with latitude, modified by the proximity of the sea on one side, and of mountains on the other; but in the interior it partakes of the character derived from high elevations and parallel chains of mountains. That character is more rigorous than the position of the country on the map would indicate, and ought, perhaps, to be classed as wintry. The winter actually, prevails with varying severity, from November to March inclusive. During this part of the year when it rains on the lower levels, it snows on the mountains; and this snow remains on the higher elevations until May. The greatest heat lasts from four to six weeks, and ranges between the middle of July and the middle of September; but even then, while the plains and sheltered valleys experience the full force of a southern sun, the mountain heights are fanned by cooling breezes and clothed, where there is soil, with unchanging verdure.

Of the climate of Janina a course of meteorological observations, extending over the last three years, enables me to speak with somewhat more of confidence. I should premise by noting that the observations have been made at an elevation of 1524 feet above sea level; that Janina is in latitude 39° 47′ N., longitude 21° 1′ E.; is 39 miles from the sea at the nearest point, is surrounded by high mountains, and is situated on the margin of an extensive lake which acts as a compensating medium on the temperature, moderating the extremes of summer's heat and winter's cold. To these natural conditions is to be added the fact that the plain and the surrounding mountains have in great part been denuded of trees. The process of denudation still goes on, and forms a number of centres in a continually widening circle. The covering of humus and soil on the mountain slopes being thus exposed to atmospheric action, has been gradually washed and worn away; so that in the place of expanses of forest, there is nothing now to be seen but bare surfaces of rock which hotly reflect the summer sun, and add to the intensity and duration of winter; while the rainfall that used to be retarded and economised in its descent by the spongelike soil and the interlacement of roots, now dashes down in a short-lived and unprofitable torrent.

These remarks seemed to me to be necessary as a preface to the subjoined figures, the deductions from which they will serve in some measure to regulate:—

BAROMETRIC MEANS.

Mean.	Highest.	Lowest.	Range.
28·400	28·614	28·131	0·483

The highest registered was on February 14, 1867 28,880
The lowest „ „ March 25, 1868 27,670

Extreme range 1,210

THERMOMETRIC MEANS IN SHADE.

MAXIMUM.			MINIMUM.			
Mean.	Max.	Min.	Mean.	Max.	Min.	Range.
68·5	78·4	56·3	47·9	57·6	38·3	40·1

The maximum registered was, July 28, 1867 .. .. .. 105·0
The minimum „ „ December 29, 1867 .. .. 13·0

Extreme range .. .. 92·0

In January, 1864, the lake was frozen over, when for several successive days the thermometer fell at night as low as zero. This freezing of the lake is of rare occurrence; the only other *recorded* instances of it took place in 1607, 1687, 1812, and 1818.

The notes for rain give the following mean results:—

	Days.	Rain in Inches.
January	18·0	8·90
February	10·5	4·10
March	17·7	6·10
April	6·8	1·95
May	6·3	0·75
June	15·4	5·20
July	7·0	1·25
August	2·7	1·56
September	5·8	1·23
October	9·7	8·14
November	10·0	7·50
December	8·8	4·76
Annual	118·7	51·44

With respect to rain the climate is very capricious, and the seasons seem at times to change functions, being characterised at frequent returns by droughts and rains of extraordinary continuance.

The following is an extract from my note-book:—" March 16th, 1865, 1 P.M. Thunder and lightning, followed by heavy rain, which left a reddish deposit. Barometer, 27·850; thermometer, 54·0; wind, S., force, 1·5. Precisely the conditions of the atmosphere on the 28th March, 1864, when the same phenomenon occurred."

This deposit was found on examination to consist of particles of silica of all colours, scarcely waterworn, and were considered to be of volcanic origin. Such being the case, it may be asked whence were the particles wafted?

The annual mean of the wind is

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Force.
62	48	43	67	25	7	15	63	35	0·10

The prevailing winds, it will be seen, are northerly, the S.E. comes next; but from observing the direction of the clouds, it appeared that this wind is often the S. deflected from its course in its lower strata by the Pindic chain. The wind seldom blows hard at Janina, only twice in these last three years has the anemometer indicated 30 miles an hour, namely, on the 18th December, 1866, and on the 9th of January last. On both occasions the wind was from the N.E.

From the foregoing data some idea may be formed of the climate of inland Epirus. It is irregular, capricious, and marked by great extremes, nevertheless with common precautions it would be in the highest degree conducive to health and physical development; and if at any time there is an apparent deficiency in this respect, the cause is to be sought, not in natural specialities, but in the neglect of natural laws.

Epirus has been visited by earthquakes, but more lightly and less frequently in later than in former years. The focus of them seems to be the mountainous district hemmed in between the two main branches of the Beratino (Apsus). Mount Tomor is the culminating point of these mountains, and in October, 1851, its base was shaken by an earthquake which was violently repeated every day for a month, and for six months with lengthening intervals and decreasing force. Light shocks are occasionally felt in other parts of the province, and the undulations of the great earthquake at Cephalonia on the 4th of February, 1867, were very sensible in Janina.

FAUNA AND FLORA.

The fauna and flora of Epirus conform to the varieties of the climate, and to the lines of vertical distance. The coast plains exhibit the products of southern regions; whence ascending, nature gradually assumes a more northern aspect. Of the animal productions there are none peculiar to the country. The wild quadrupeds are the brown bear, wolf, fox, jackal, pig, deer of several varieties, and chamois; the smaller kinds include the hare, rabbit, otter, weasel, squirrel, &c. The Hanover rat has established itself in some of the coast towns, whence it has driven the native rat, which is smaller, less mischievous, cunning, and ferocious.

All the quadrupeds that have been domesticated in Western Europe are to be found in Epirus; buffaloes are bred on the lower plains, and the Molossian dog still retains his size and fierceness in his native mountains about Lingon and Lakmon. The horses, cows, and sheep are of small degenerate breeds, which is not owing to any defect of soil or climate. The horses of Epirus, on the contrary, were but a few years back highly prized throughout the Levant; and it is worthy of note that the plain of Musakia is considered the only place in European Turkey where the Arab horse can be bred without deterioration. The experiment was made about seventy years ago with perfect success. The horses of Musakia were long in great request; but, either from careless breeding or an exhaustive demand, this valuable race is now well nigh extinct.

Of the wild birds the chief are the eagle, the griffon, vulture, kite, tawny owl, the great horned owl, hawks of different kinds, the bustard, crane, and heron; in winter the wild goose resorts here, and many varieties of duck and waterfowl, woodcock, snipe, quail and partridge, invite the sportsman. Most of the tree, hedge, and field birds of England are common in the country, together with many of colder and of warmer climates. The white stork seems to claim a special notice. It is a migratory bird; it arrives about the 23rd of March, and leaves about the 23rd of August, and so regular are its periods that any considerable deviation from them is a sure prognostic of an abnormal season. It does man a service by destroying snakes, and it is revered by Mussulmans, who believe that it winters in the country about Mecca. For these reasons it is protected by law and religion, and in conscious security, and discernment as it were of its friends, it familiarly builds its nest near the dwellings of Mussulmans and within the precincts of their temples.

The domestic birds are the same as in England. The peacock is unknown in the country, and the Guinea-hen, lately introduced, is kept by a few as a rare and ornamental bird.

There are several varieties of the serpent kind; the largest being the marsh snake, which sometimes attains the length of 5 feet. Some of them are said to be venomous; but, thanks to the stork and their other enemies, their numbers are very much kept down.

Of the insect tribes there are none peculiar to the country; nor do they, so far as I can judge, present any great variety.

Of those that are useful to man I know only of the honey-bee, the silk moth and the kermes (*Coccus Ilicis*): no attempt is made to improve this last by artificial cultivation; it is found in only a few places, and it yields a rich violet crimson dye.

The vegetable productions partake of all the varieties of the soil and climate. The mountain heights, where the woodman's axe has not reached, are crowned with pine, oak, beech, and elm; the walnut, plane, chesnut, scyamore, and cypress, are common throughout the lower levels; the olive was introduced by the Venetians, and flourishes in the coast districts; and 20 years ago the mulberry was made a denizen of the country.

Of fruit-trees, the apple, pear, quince, pomegranate, fig, peach, apricot, cherry, plum, orange, lemon, and citron, are indigenous. The gardens about Parga are specially reserved for the large citron, which is used by the Jews in some of their religious feasts.

The physical character of the country being known, it would be superfluous to describe its botany; I would only mention that, among other useful plants, the liquorice, the hop, and the cotton-plant, grow wild in many parts of the province—the latter has been brought under cultivation; tobacco succeeds well even at elevations of 1600 feet; but the tobacco of Epirus is not highly esteemed in the markets of the East. Twelve years ago the potato was added to the vegetable products of the country; it succeeded perfectly well, and the cultivation of it continues to extend.

MINERALS.

As no geological survey has ever been made of Epirus the mineral resources of the country are almost wholly unknown. That they are considerable I am disposed to believe. Mount Lakmon is richly charged with iron-stone, beds of lignite have been found in the districts of Suli, Djumerka, and Avlona; kaolin in large quantities near Avlona, and salt-mines in Djumerka. At Selenitza, on the banks of the Viossa, 15 miles from Avlona, there are pitch-mines of great value, to which a scientific observer has assigned an approximate area of 4 square miles, with a depth varying from 50 to 100 feet; this is most likely under the mark, for the district of Paktos, 9 miles to the N., is also rich in bituminous matter; and it is presumable that the two places are comprised in one mineral field.

I must resist the temptation of including in this paper a sketch of the comparative geography of Epirus, and of the etymology of its ancient names: this would be entering a field of inquiry, which, though connected with the present subject, is of such variety and extent as to call for a separate dissertation; if I have occasionally touched on it in the course of the preceding observations, it was only to elucidate some passing question, or to confirm some uncertain identity. Archaic researches would, moreover, detract from my present object, which is to exhibit Epirus under its natural aspect with reference to physical resources and industrial capabilities. That aspect, it is true, has undergone some changes, and was in former ages modified by human industry, and by a civilisation of the elder times. But those early works of man were sacrificed to the terrible vengeance of an exasperated master. Epirus has never recovered from the desolating chastisement inflicted upon it by Æmilius Paullus, 167 years B.C.; and at this day the country, with its fine climate, its varied resources and commanding position, is appealing to man to recommence the work of scientific industry and progressive improvement.

I shall conclude by observing that Epirus is inhabited by a heterogeneous population of about 350,000 souls, of whom the greater part live by husbandry of a primitive fashion, and are dispersed in villages and hamlets to the number collectively of 1600 and more. For the non-agricultural part of the population there are Janina, the capital, and some 15 or 20 small towns of moderate pretensions.

Yanina, January 19, 1869.

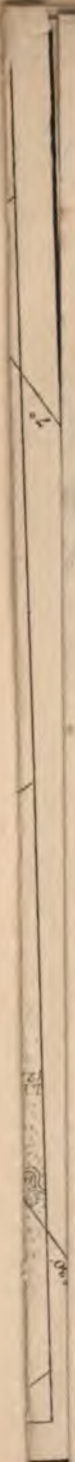
XIII.—*Notes of a Journey up the River Juruá.*

By W. CHANDLESS, Gold Medallist, R.G.S.

THE journey, unsuccessful in its main object, of which the following notes are offered, was made during the last five months of 1867.

Though furnished with recommendations from the Government at Manáos to the local authorities of Teffé, which was my starting point, I had the greatest difficulty in obtaining a crew even for one canoe; in fact, as one of the men I counted on failed me at the last moment, I could not have started but for the kindness of S^r^ João da Cunha Correia (himself an explorer of the Juruá), who to complete my crew sent with me a slave of his—a man very useful on the lower part of the river, as he knew that, and the Indians on it, but in the crisis of the journey as bad a man as I could have had with me. Mine was Hobson's choice, or I would not have taken a slave.

The river Juruá is at least one-third smaller than the Purûs, but in other respects so similar that a very short description of its general character will suffice. Its water is "white," or



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muddy; it is very tortuous, and consequently has cut off many bends, and thus made many lakes, or rather backwaters. On the convex side of the bends the land is generally "igapó," fringed by sand-banks, left dry in the dry season; on the concave side it is alluvial plain (varzea), with here and there "terra firme," abutting on the river with cliffs (barreiras). Both the "terra firme" and "varzea" are, as a rule, lower relatively to the water-level than on the Purûs; in other respects alike.

Cocoa (cacao), copaiba oil, and sarsaparilla, are the chief natural products sought, and seem abundant; within the last few years, however, india-rubber also has been procured. So far as I have seen, the india-rubber trees are more scattered than on the Purûs. The Brazil-nut-tree, elsewhere generally abundant on "terra firme," is exceedingly rare on the Juruá. Above the mouth of the River Tarauacá the tocun-palm (the fibres of which, both unmanufactured and in cord, are the chief export of the River Japurá) is very common.

The only impediment to navigation that I am aware of is a shallow, wrongly called Urubu-cachoeira (as it is not a rapid), which is somewhat troubled with snags; but—as far as I could examine—with but little rock, and that only near the left bank. I am told that in very dry seasons it is difficult of passage even for small canoes; but on my return at the end of November, with continuous soundings, I found in the middle of the river nowhere less than 6¾ fathoms and the river had still at least 1½ fathom to rise. Therefore, for much the greater part of the year, it would not be an impediment even to a steamer. There is also, lower down, a place called Cachoeirinha; but this is simply a ledge of rock near the left bank, and the channel on the right has more than average depth. In general the Juruá is much more free from snags than the Purûs, and from the farthest point reached—1100 miles or so from the mouth—we always floated down at night without keeping watch; a precaution I did not venture to neglect on the Purûs, though a larger river, till within 600 miles of its mouth, and the first night I did so we struck on a snag.

In the dry season, the water of the Juruá, at least the surface water, attains a very high temperature, perhaps from being heated in passing along the edge of the sandbanks. On one occasion I found it above 88° Fahr., and often 87°. On fine bright days in August and September there was usually a difference of 2 or 3 degrees between the temperature at sunrise and that at 2 to 3 P.M. The water, of course, was tested more or less in mid-river; generally when we were crossing from one side to the other.

In the sense in which commonly a river is said to have islands, the Juruá has none; the tracts cut off by the Mineroá, Bereo, and other channels, are too large in proportion to the size of the river to be considered such. In the valley of the Amazons, if the application of the term *island* were not limited, it would be hard to say when one is not on an island. These channels are noticeable for the large size of their mouths, or lower entrances, but little inferior to the main river; but in their upper part they are small, and can scarcely in full flood bring down more than one-eighth, or perhaps one-tenth, of the river water, and in the dry season none at all. On my return I came down both these channels.

The Mineroá channel can be passed at all seasons by small canoes, but in one or two places with difficulty. From its upper entrance to the Resaca Grande it is scarcely over 60 yards wide, but with (in December) a strong current, and 5 fathoms depth. Below that it has less current, but is wider; it is however in few places over 150 yards, till its last three or four miles, where it widens greatly. From where it assumes an easterly course the country between it and the Amazons is one of those labyrinths of lakes and channels which, however often I may see them, never fail to impress me with wonder. *I am told* that in the dry season the water from the Resaca Grande often runs out by the upper entrance,* and that then there is no current *down* till below the mouth of Lake Mineroá, and below that black water. The tendency of side channels of this kind running *from* a main river to accompany that *up* stream, with a course as if of an affluent running to it, and sometimes for several miles, though not uncommon, is remarkable.

The Bereo is somewhat larger than the Mineroá channel, but has less current; and in the lower half, where it widens out to 200 yards or more, it had (in December) scarcely a perceptible one. In August its upper entrance was completely barred by a sandbank, and I walked across it dry-shod. Its course is tortuous and capricious, but the *very* near approach to the main river (about half-way) must be received with some reserve, as depending for some distance on dead reckoning. On this channel, a little below the mouth of the Igarapé de Bereo, is a village of Marauá Indians. They have another on the Tucumá channel, and also on the Mineroá channel, and there is one family of them near the main river on the Igarapé Caá-piranga. In all, those on the Juruá can hardly amount, I think, to 80 souls. At this village, including children, there were 28 but five were from below. These Indians, though they still hold together, may be considered now a part of the ordinary population of the Amazons; they all understand and can speak the *lingoa geral*, and are I believe all baptized; moreover, they have a considerable admixture of non-Indian blood.

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* The same occurs on a larger scale (as I have been told on the spot and by many persons) in the Canumá or Urariá channel, as it was formerly called, between the Rivers Madeira and the Amazons. For about eleven months of the year the water runs from the Madeira, and when that river is rising with an almost furious current; but usually for about three weeks in the month of October, when the rivers are at their lowest, the reverse is the case, and the river Canumá then bifurcates; a part of its black water running westwards to the River Madeira, and the remainder eastwards to the Amazons.

The Tucumá channel was not passable in December, and is so only in full flood; the Arapary channel is, I am told, still smaller; and neither of them deserves any more detailed notice.

On the large Igarapé Jaraquí is a village of Catauixis, the only one of this tribe on the Juruá, with about 20 men; including in this number lads above fifteen. They are said to be the remnant of a much larger population. The number of Indian tribes represented on the Juruá, and the small number of the representatives is notable. These Catauixis, like those of the Purûs, are industrious and skilled in the making of pottery; but they have had much more intercourse with traders, &c., and have now but few distinctive characters. They were now all up-river, working at india-rubber for a trader.

As both the water-side Indians and the traders who travel up the river are comparatively few, the Juruá is extraordinarily abundant in fish and game. Mosquitoes are not much felt till above lat. 6° 30′ s., and then only in certain parts. Pium-flies[*] also are somewhat less numerous than on the Purûs, but Maruim-flies[†] infinitely more so; for the first time I realised, as not improbable, Humboldt's estimate of 1,000,000 to the cubic foot of air.

Above the Catauixis there are no Indians till lat. 5° 30′ s., where on the igarapé Chiué, is a single village of Arauas. I found them camped on a sand-bank hard by. Herndon mentions them as treacherous; and in fact they have killed one or two persons somewhat treacherously, but perhaps not without provocation. They have long had dealings with traders, and seem not a warlike, but a timid race. In language they are akin to the Purû-Purûs (Pammarýs). A good many of them now speak the "lingoa geral," and all I saw were regularly clothed, like ordinary Amazons-folk. I was much pleased with their courtesy and friendliness. Though curious to see things, they did not beg. Two of them agreed to accompany me, and of course I paid them in advance. Their companionship lasted

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[*] "Piúm: musca Simulium, interdiu infestans." 'Gloss. Ling. Bras.,' p. 470.

[†] "Maruim: insectum musca, sole occidente grassans." Ibid. p. 462.

5 days only, up to the River Chiruan. Beyond this they were evidently unwilling to go; therefore, seeing that they purposed to steal away at night, I told them they were free to go by day. They seemed grateful, and voluntarily brought back to me such of their pay as they had with them, offering even the clothes they had on. Their chief reason was fear of the Indians above (Culinos); but they seemed little accustomed to hard work, such as rowing all day, for Indian journeys are very short. Moreover, they fared badly; for one of them had a pregnant wife at home, and the other an infant child: and under these circumstances they will eat but of certain food; not of any skin-fish, nor of all scale-fish,; *e.g.*, not of tambaqúi, nor piranhas: one would not eat of the male turtle, and the other neither of the female nor of the eggs; nor would they eat ducks, nor wild pigs, nor tapirs. In fact, they would eat of nothing easily attainable, except curassow-birds; and even on the Juruá it is hard to ensure an unfailing supply of these. I understood the motive of this quasi-fast to be religious, not physical; but they were averse to being questioned on the subject, and my delicacy prevailed over my curiosity.

The Chiruan is the first affluent of the Juruá that is entitled a river, those below being only igarapés. It is but some 35 yards wide, but had 1¾ fathom depth even in the heart of the dry season, and runs out with a fair current; its water was then a yellowish brown, but in the season of flood is black. Many black-water streams have this change in the colour of their water, according to the time of year. It is said to come from some distance, running not far from the main river, but it nearly approaches the river Tapauá (affluent of the Purûs), or some affluent of that river.

Above the River Chiruan on the right side of the Juruá is the country of the Culinos,—a numerous tribe of the interior, who are said not to have canoes, but to come by land to the sand-banks at the time the turtles lay. They are considered treacherous and hostile if in sufficient numbers; consequently it is a rule of travel always to sleep on sand-banks on the left side of the river, in this part,—a necessity which sometimes induced us to stop earlier, sometimes to travel later than I would have wished. We saw nothing of them; and, from other Indians above, heard that they had not been seen on the sand-banks for the last 2 or 3 years. They are met with also on the River Tarauacá, and probably extend a considerable distance S.W.

For ten days' journey above the mouth of the River Chiruan there are no waterside Indians on either bank of the river (Juruá); the first village being one of Conibos, by the small Igarapé Acará, their only village on the Juruá. These Conibos are the same tribe of Indians that on the Purûs I have spoken of by the name of Maneteneryˊs, and which the Brazilian explorer Serafim erroneously called Cucamas, though they have not a word in common with the latter. Whether they are true Conibos or not, I cannot say;* but they call themselves, and other Indians call them, such. They may have been originally a colony from the Purûs, or those of the Purûs may have passed to that river from the Juruá, and these remained behind. As to this I could ascertain nothing, except that they are not new comers, but have at different times occupied various sites above and below their present one. Now they are a sort of trading-post for the rest of their tribe. They work more or less for traders, and sell their superfluous iron implements to their brethren of the Purûs, from whom they buy the long ponchos of cotton-cloth, which the latter weave and wear, and which these wear but do not weave. Almost every year they send an expedition to the Purûs, or rather to a village three days' journey inland from that river, as they told me. A number of them whom on my return I met with here, were now absent on such an expedition. They all knew of my journey up the Purûs—perhaps I made a bad market for them that year—and informed me that my servant was killed by people of their tribe, as I had originally believed, and indeed written in my paper on the Purûs, and not by Hypurinás. I was glad at least to find the latter, a fine warlike race, freed from this stain of treachery, which ill-suited their character. Reports that come through Indians, I may observe, merit little reliance; and not a whit more for being very circumstantial. A catastrophe that never happened is told in minute detail.

These Conibos are just as tiresome and importunate beggars as the "Maneteneryˊs," and a singular contrast in manners to all the other Indians of the Juruá; particularly to some who chanced that same afternoon to come to the sandbank at the mouth of the Acará. These were from a village a few miles above; part of them Canamaryˊs, and part of a tribe known as Fish-Indians. The latter belong to the river Cuniuá, an affluent of the Tapauá (itself an affluent of the Purûs), and had come to the Juruá only four months before. I got one of them to mark on the sand their route—down the Cuniuá to the Tapauá; up this—overland to the river Chiruan—and so out on to the Juruá. Their language seems akin to the Araua and Purû-purû; but, for lack of an interpreter, I could inquire nothing as to the cause of their migration. But for my catching the name Cuniuá, I should not have found out even thus much; as the Conibos knew only that they were new comers, but neither understood their language nor seemed to feel the smallest curiosity respecting them. They brought us fruit, and a few trifles for sale, but did not come empty-handed to ask for anything. On the following morning they continued their journey downstream; why or whither I did not learn. Their dress was simply a "tanga"—by courtesy translated "apron." Most of them had necklaces of beads; the chief had a crescent of shell suspended from his nose. Besides bows, they had the "palheta" or stick for throwing arrows; but they use this only for striking fish and turtles.

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* If so, the acquaintance of the Maneteneryˊs with the Ucayali and Sarayacu is at once explained. A comparison of the languages would decide the question.

These Canamarýs did not understand any of the words (a very few) which I had obtained from those on the Purûs; nor do I find any of them in the Canamarý catalogue in the 'Glossaria Linguarum Brasiliensum,' but every one in that of the Culinos or Maxurunas. One word seems to me instructive: the common answer of the Canamarýs I met on the Purûs, if asked for something they had not, was "Yamai," equivalent to the Spanish "No hay;" in the Culino catalogue ('Gloss. Ling. Bras.,' p. 243) I find "morior = yamai." On the whole, I am inclined to think that on the Purûs there are two tribes of Canamarýs; the one, which I did not meet, true Canamarýs, and those above, whom I met with, more probably a branch of the Culinos. The latter, however, called themselves, and the Manetenerýs (or Conibos) called them, Canamarýs.

I engaged two men of this Conibo village to work in my canoe, and found them good men for work; very different from the poor Arauas. They had no scruples about food, but a great avidity for salt; so that my stock of salt fish, which we had scarcely touched, and which my men had wished more than once to throw away, was to them the greatest of treats, and one of which they did not tire to the last. On my return these two men remained at their village; and two others asked me to give them a passage to Paranarý, the house of Sr. João da Cunha a little above Teffé. As I afterwards heard, they stayed with him but about ten days, and then stealing a canoe and sundry axes, guns, and other loose articles, went back to the Juruá.

A week's journey from this Conibo village we fell in with some Catuquenas, who chanced to be at their port: their village (maloca) was, they said, a day's journey inland. They are one of the most widely scattered tribes of the Amazons, but not often met with on the banks of white-water rivers, owing to their aversion to the insect-plagues. The men seemed fine, tall, strong fellows; only apron-clad.

In a few days more we reached the mouth of the river Tarauacá, the chief affluent of the Juruá; and nearly two-thirds the size of that river above. From this it might be termed a confluent, but it enters strictly at right angles, and its general course for the distance I went up it—some 16 or 17 miles—makes rather an obtuse angle with the Juruá. Its mouth is 130 yards wide (as I found by triangulation), but within, the river is somewhat wider. I found 5 to 6 fathoms depth, which was about a fathom less than the average depth of the main river for some distance above, but the latter was in fuller flood. The water of both rivers is white, and I could see no difference in the colour, and found only 0·5° Fahr. in the temperature. One of M. Castelnau's informants (whose names seem now quite forgotten in Teffé) gives the water of the Tarauacá, and the other that of the Upper Juruá, as black: both erroneously. In general, reports on this point may be trusted, as it is a fact usually observed and remembered; indeed, black and white water rivers differ in their general aspect as much as a negro and an Indian. One of the two informants also states, that *a little* above the Tarauacá, the Juruá divides. I travelled, however, exactly a month up stream above, and met with no such bifurcation.

Before leaving the Tarauacá, it is necessary to say a few words as to the course of the Juruá. This from about the parallel of 6° 30′ S., to the Amazons, is not very different from that usually marked, though even in this part it makes more easting; but above that, for a considerable distance, it runs nearly from E. to W.; just as the Purûs does along the parallel of 9°, and its affluent, the Aquiry, along that of 11°, and as the river Javary (as we know from the recent exploration by the Frontier Commission) does nearly along that of its mouth. This easterly direction of the rivers must be considered a marked feature in the district between the Madeira and Ucayali; as though there were a series of parallel ridges, or steppes, between the upper Amazons and the base of the Caravayan Andes. On the Juruá, at any rate, this easterly course is evidently caused by a ridge, or rather, perhaps, the edge of a range of high land, but that cannot be called a range of hills, running about E. and W. on the left side of the river; generally inland, but against which this strikes from time to time and rebounds, till at last it rounds the end in a very noticeable bend. Indeed, throughout the whole distance I travelled, the *terra firme* is mainly on the left, and what there is on the right, is comparatively low; in connection with which is the fact, that on the left the Juruá has not a single affluent, except small streams—igarapés and lake-mouths.

The above-mentioned bend is, as might be expected, the point where the Juruá most nearly approaches the Purûs; the distance being, according to my maps, 104 geographical miles in a direction a little S. of S.E. from this bend to near the mouth of the Pauynim on the Purûs. This may be the approach that in old times was reported; and I should be very bold were I to say that Indians may not have passed from the one river to the other here. The Indians, however, now existing here are of tribes warlike, numerous and intractable: the Hypurinás near the Purûs, the Culinos near the Juruá, and the Jamamadýs * in the centre.

The approach, that in modern times has been spoken of, is one higher up, by way of the Tarauacá; and, in fact, can hardly be called an approach of the two main rivers at all. João da Cunha travelled up the Tarauacá and the Embira, an affluent of it on the right, 8 or 10 days' journey from the Juruá, he tells me, and thence overland to the bank of the main Purûs; and this was formerly the regular route of the Conibos on their trading journeys: but, in consequence of frequent attacks from Nauas, wild Indians of the upper Juruá, they abandoned it, and now have a path from Lake Yra-oçu (Great Honey Lake), some distance below, which cuts across to the Embira.

It is an odd coincidence—for it can hardly be considered more—that on my maps the point of the Purûs nearest to the mouth of the Tarauacá is almost exactly that at which the path from the Juruá strikes the former river, 130 geographical miles distant.

I have but little doubt that the small affluent of the Purûs, which I marked with the name Tarauacá, is not entitled to that name; and that the Indians merely meant that it was a way of passing to the great affluent of the Juruá. A complete water-communication has indeed been reported to exist between the two rivers; but the Conibos told me they knew of none such.

About 5 miles above the mouth of the Tarauacá a very large igarapé Goabyru-paraná (Rat River) enters the Juruá on the same side. As its water is white, I should have thought it another mouth, but that the temperature was nearly 5° Fahr. lower. This is the last name of which I could obtain any report. None of the Conibos were acquainted with the upper Juruá; nor have drug-collectors, at any rate in recent times, been materially higher, chiefly from fear of the Nauas—a fear that soon began to show itself in several of my men. Twice the

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* The Culinos and Jamamadýs may possibly be the same tribe under different names: the latter at any rate, like the former, are said not to use canoes at all.

oars, or paddles, were thrown away at night, in the hope of thus stopping the journey, or perhaps causing a return. On the first occasion, however, all, and on the second two, of them drifted ashore at the lower end of the sandbank on which we had slept. After that, as I had no more spare oars to lose, I always at night collected all in use and put them in the stern, and slept on the top of them. Next a camp-kettle vanished; but I said I could live very well on roast, and the remaining one was spared. Fortunately it is not easy to injure a canoe of hard wood without making a noise. It would be unjust to imply that all the men were capable of such acts: three I am sure were not, and perhaps I wrong another; one only, however, was of good courage, and went with a good will. In his honour (*si qua est ea cura*) I called the next affluent River Gregorio.

This is a good-sized stream, more than 50 yards wide, and then (Oct. 25th) 4 to 5 fathoms deep, and flowing out bravely with water much like that of the Juruá. I was surprised to find its temperature 1·7° Fahr. higher than the latter, there only 80·0° then.

Up to this we had seen no signs of Indians, except one or two small plantations nearly choked with wood; but in a few days we came rather unexpectedly upon some on the river-bank. They turned out not to be the dreaded Nauas, but of what tribe they really were, what they were doing, and how and whence they came to the place we met them at, remained a matter of conjecture. There were 15 or 16 men on the bank-side, with women and children close inland; but it was not the "port" of an inland village and we saw but one paxiuba-canoe, which could not have carried above six or eight persons. They evidently had no fear of our attacking them, nor any intention of attacking us; for they sold very willingly their bows and arrows, and came on board my canoe in such numbers that we were regularly mobbed, owing to which it was impossible to inquire or learn much. They varied a good deal in appearance and permanent ornamentations; one or two, for instance, had pegs under the lower lip; one seemed to me a half-breed, having a beard and moustache, and neither Indian hair nor type of face. The only word I recognised was "wary" (sun), the same as in the Culino and Maxuruna languages; so perhaps they belong to one of these tribes. One thing they explained to us very clearly, viz., that in eight or ten days more up-stream we should meet the Nauas, who would fight us: a piece of information only too correct. On our return we saw nothing of these Indians.

I had the satisfaction of reaching one more affluent—like all the rest, on the right; a small river, to which I gave the name Mu, as I had hoped at its mouth to have observed an occultation of μ Piscium, but cloud prevented this.

At last, one evening, we reached a Naua plantation, the size of which showed they were somewhat numerous, and its cleanness that they had been recently there. The next morning we shortly passed two more plantations, and rounding a point reached the "maloca" of two large houses. The people were apparently all absent, but at this moment a canoe from above came in sight; we called to those in it, but they turned back up-stream. About three miles above we found them all on the river-bank. They had three very long but narrow canoes, and at once ran to these, beating their breasts with their hands, and their large round black shields (of tapir-hide, it is said) with their spears—for they had spears as well—and bows and arrows. Only two of the canoes put out, and one kept a good way behind the other, the foremost having but five or six men in it. From their gestures I can scarcely doubt that they came out to fight, but I doubt a good deal whether at first they knew that we were white people, and I hoped by showing beads, &c., to bring them to a parley. But when they were eighty or ninety yards off, and still making signs of war, my men, recollecting the disastrous attack of the previous year (1866) on the Brazilian-Peruvian expedition up the river Javarý, would wait no longer, and despite my orders fired before an arrow had been shot at us. The first shot missed, and they still came on, but the second wounded one of the Indians in the arm, and then they stopped, and at a third shot retired. We followed, but as they were both up-stream and in-shore of us they gained the bank; here there were about thirty Indians, just under cover of the wood, but of these how many were women I cannot say. One arrow only was shot at us, and that fell short. We stayed about half an hour opposite them, and out of arrow-shot, to see what they would do. Perhaps they stayed where they were with a corresponding intention. They did nothing; we the same. But at the proposition of continuing our journey, there was a general outcry of all my men, with one exception, against doing so. No doubt it involved a certain amount of danger, as an up-stream canoe must stick close to the bank, and it would have been easy for the Indians to plant ambuscades, but from their bold daring I doubt whether they would have done so. To fight our way, or even resist continual skirmishing attacks, we were too few, being only eight in all, and the two Conibos and a Miranha could not be counted on in danger. But we should have gone and seen. Had we done so and been again attacked, I should have been content to turn back. As it is, I look back on the day with shame.

We floated down-stream till out of sight, that we might not seem to run away, and touched at the village (maloca), where some Indians must have remained, as a fire was alight. We carried off a little pitch we found, for which I left ample payment in iron implements, hoping that this might make the Indians understand that our object was not to harm them.

The river at this the farthest point of my journey had an average width of 130 to 150 yards, and a depth of 5 to 6 or 6½ fathoms; it had however here nearly reached the last flood-mark. It would be idle from the size of so considerable a stream to conjecture at what distance its source may be. But from the geography of the surrounding rivers some probable conclusions may be drawn. The Ucayali, below the mouth of the Camisea, as we learn from M. Castelnau, receives on the right no stream of any importance; obviously, therefore, from a very short distance to the east of it, the water falls into other rivers. The Purûs and the Javary certainly rise not far from the Ucayali (as also perhaps may the Jutahy); the Javary very little s. of 7° lat., and the Purûs, with its upper affluents, from lat. 10°, to 11° or 11½°. It seems to me therefore very probable that the Juruá rises in about 9°, or 9½° s. latitude, and, like the other rivers, near the right bank of the Ucayali.

POSITIONS ON THE RIVER JURUÁ DETERMINED BY OBSERVATIONS.

	Lat. South.	Long. W. of Greenwich.	
		In Time.	In Space.
	° ′ ″	H. M. S.	° ′ ″
Mouth of River Juruá (right or lower point) ..	2 37 36	4 22 54	65 43 30
Igarapé-Pixuna (mouth)	3 17 13	4 23 58	65 59 36
Marauá Village (on Paraná-mirim de Bereo) ..	3 26 32	4 25 6	66 16 30
Upper mouth of Bereo Channel	3 48 46	4 25 18	66 19 30
Mouth of L. Magoary*	3 57 10	4 25 42	66 25 30
Igarapé Jaraquí (mouth)	4 27 47	4 26 12	66 33 0
Point on right, opposite Sacado de Tengué (in which is upper mouth of Tucumá Channel)	4 40 55	4 26 47	66 41 45
Urubú-Cachoeira	5 48 45	4 31 22	67 50 30
River Chiruan (mouth)	6 3 12	4 31 21	67 50 15
Barreiras de Curuá (lower end)	6 36 30	4 36 35	69 8 45
River Tarauacá (mouth)	6 42 14	4 39 16	69 49 0
Sacado (mouth of Igarapé opposite)†	6 44 17	4 41 36	70 24 0
River Gregorio (mouth)‡	6 50 13	.. ..	.. ..
River Mu (mouth)	7 10 55	4 47 24	71 51 0
Farthest point of observation	7 11 45	4 48 6	72 1 30

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* The longitude was determined by the end of the eclipse of the sun, Aug. 29, 1867. From the point of observation, the lower mouth of the Tucumá Channel (more easily recognised) is about 1·25′ s., and 0·5 sec. w.

† By Jupiter I. Ec. R., Oct. 21, the longitude is 4h. 41 min. 24 sec. w.

‡ A very indifferent observation, owing to misty cloud; the result, however, agrees well with the dead reckoning from points of observation not far above and below.

The observations were similar to those made in my journeys on the River Purûs. Observations of latitude and of time (for longitude by chronometer) were taken at 56 points, including those given above, besides a few of latitude only. On my way from Teffé to the Juruá, at a point called Parauary, formerly an Indian village, and marked on many maps, I observed an occultation,[*] and on the river Juruá—as given above—the end of the eclipse of the sun. The longitude of the mouth of the Juruá was determined chronometrically with reference to these two points, and as the difference of that given by two chronometers is only 1·2 sec., probably that longitude is pretty nearly as correct as the absolute determinations. The same may be said of all the longitudes up to lat. 4° s. Above that, unfortunately, I could obtain no equally good absolute observations, and the longitudes are simply chronometrical; referred of course to the point of observation of the eclipse of the sun. To diminish the dependence on chronometers, and the probable error, in all possible cases time-observations were repeated on the down-voyage at points where they had been taken on the up-voyage (but except in special circumstances not at new points, as this might have distorted the river). Thus the farthest point of observation depends twenty-one days on chronometer; others proportionately less. The rate assumed was that given by time-observations at the same point, on November 6th and 13th (*i. e.,* going and returning); the interval being long enough to eliminate the effect of small errors of observation, and at the same time so short that it was scarcely likely, as the two chronometers had not varied their relative, that they should have varied their absolute, rate. With this rate [†] the differences of the longitudes given by the two chronometers are very small, the extreme being under 6 sec. These, which for brevity I will call *down*-points, have served as base-points for the determination of intermediate up-points. The intervals are so small that not much additional error can have been introduced.

A few eclipses of Jupiter's first satellite were observed; but two only with perfectly clear sky. One of these observations having been made at a definite point (that is, not a mere point on the river-bank, with nothing to mark it) is given above. It will have been seen that this longitude differs only 12 sec. from the chronometrical, and the error is on the right side, the *re*-appearance having been observed too late, and therefore giving too small a longitude. The other observed in long. 69° 3′ gives a longitude 3·5 sec. *greater* than the chronometrical, and therefore certainly argues some amount of error in this, which however I have adopted in the map.[*]

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[*] August 7th, 1867. γ Libræ Oc. D. (at the dark limb of the moon), giving the longitude of Parauary 4h. 19 min. 8·8 sec.

[†] Assuming during the whole journey above the point of observation of the eclipse of the sun, the mean rate given by time-observations taken; there, in going and returning (at an interval of 101 days), the resulting longitude of the "farthest point of observation" is 17·2 sec. less than that given above.

On the whole, I hope these longitudes may be tolerably good approximations. So far as my experience extends, in a steady canoe, on rivers like the Purûs and Juruá, where there is little or no swell, chronometers rate as well as on shore.

Complete duplicate computations were made of the occultation and eclipse of the sun, as of similar observations on the Purûs, though not mentioned.

From the impossibility of obtaining simultaneous observations elsewhere, only the following barometrical observations were taken on the Juruá.

Near River Tarauacá (flood-level).

Oct. 14, 9 A.M., Bar. (at 32°), 29·503, Air 77·9°
Nov. 19, 9 A.M., Bar. at 28°, 29·627, Air 80·1°
Whence the height above Manáos is 249 ft., and above sea-level 380 ft.

Near River Mu (flood-level).

Nov. 14, 9 A.M., Bar. (at 32°), 29·466, Air 81° : from which, and the 2nd observation at the Tarauacá, River Mu is 15 ft. above River Tarauacá (mouth), and 531 ft. above the sea.

For the determination of the height of the river Tarauacá, in lack of simultaneous observations, I have availed myself of a table[†] of monthly means of meteorological observations taken at Manáos (at the level of the *new* church, 16·09 mètres, or 52·8 ft. above the mean level of the river Negro) by the Frontier Commission, during the years 1861-67; using the mean of the October and November means at Manáos, and correcting my observations for a slight difference in the barometers, *which have been compared*, and approximately for the diurnal variation. The height of Manáos (church) above the sea has been determined by the Frontier Commission from this series of 11,799 observations here, and 9007 at Pará (part of them simultaneous), as 39·98 mètres = 131·2 ft. There is, I think, no reason to doubt this being a thoroughly good *baro-*

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[*] As the point of the Juruá nearest to the Purûs is in longitude 68° 13′ w., probably, *cæteris paribus*, the least distance given above, viz., 104 geographical miles, is a trifle too small.

[†] For this and much other valuable and interesting information respecting the meteorology of the Amazons, I am indebted to S^{r}. José da Costa Azevedo, Capitão de Fragata in the Brazilian Navy, and chief of the Frontier Commission (practically during its whole continuance); whom I must also thank for the courtesy and kindness with which he offered me free access to, and use of, all their records and data, as well geographical as meteorological.

metrical determination. My own observations—nearly one thousand—but including none during the last five months of the year, would give probably even a *less* height. Whether however under the circumstances,—a gradual slope of country and the prevalent wind from the sea (cf. Sir J. Herschel, 'Meteorology,' § 161, near end) a barometrical determination, even from years of observations, will give a sufficient height, is another question. Still, it is to be remembered that Obidos is much nearer to Manáos than to the sea, and the tide is sensible at Obidos. To what vertical height a tide-wave may roll up under various circumstances would perhaps be difficult to say; but in a large open river like the Amazons it could hardly be considerable. As the current of the Amazons is at certain times and places very great, it has perhaps been too readily supposed to be so generally; but opposing instances are not wanting. Mr. Bates tells me that once on the upper Amazons, after floating a whole night, he found that he had not floated down perceptibly, or at any rate materially.

It may be well to add, as affording to some extent a limit of error from want of simultaneous observations, that the absolute individual maximum and minimum of the whole series of 11,799 barometrical observations differ only 0·403 inch, and this difference includes the diurnal variation (about 0·125) which is not casual. Probably therefore in this part of the valley of the Amazons, giving an ample margin, 0·200 may be considered the extreme amount of error possible.

The interest and importance of the topic will, I hope, excuse this rather lengthy discussion.

DISTANCES.

	English Miles.	Geographical Miles.
Mouth of Juruá to upper mouth of Mineroá Channel ..	65	56
,, ,, lower mouth of Bereo Channel	78	68
,, ,, upper mouth of Bereo Channel	173	150
,, ,, lower mouth of Tucumá Channel ..	193	167
,, ,, upper mouth of Tucumá Channel ..	290	251
,, ,, Igarapé Banana-pixuna (mouth) ..	433	375
,, ,, River Chiruan (mouth)	542	470
,, ,, River Tarauacá (mouth)	828	717
,, ,, River Gregorio (mouth)	953	826
,, ,, River Mu (mouth)	1105	957
,, ,, farthest point of the exploration ..	1133	982

ARAUÁ WORDS.

English.	Arauá.	English.	Arauá.
Turtle	Chirifuá.	Axe	Barí.
Male turtle (capitarỳ)	Camará.	Sun	Mahí.
		Moon	Massicú.
Tracajá	Chirí.	Water (and river)	Pahá.
Male tracajá	Jujú.	Fire	Si-hú.
Peixe-boi (sea-cow)	Afina.	Star	Amóa-hüá.
Tapir	Awí.	One	Warihí.
Dog	Jumayhí (English *j*).	Two	Famihí.
		Three	Arisafahá.
Tortoise	Coasá.	Yes	Naida-á.
Fish	Abaigauá.	No	Hina-á.
Wild Pig	Isamá.	Good	Amozadí.
Taititú	Nubasá.	Bad	Amozaraha-dí.
Mutum (curassow-bird)	Fazú.	Sick	Amozarahá-nahadí.
		Plenty	Töodí.
Mutum-assu	Arí-borí.	A lie	Timaudí.
Hen	Tacará.	Man	Maquidá.
Eggs	Nafariná.	Woman	Waidauá.
Banana	Fanará.	Boy	Ganahí-quidauá.
Tobacco (or "parica")	Agá.	Father	Abí.
		Mother	Amí.
Calabash	Wäú.	Hand	Usafá.
India-rubber	Carú.	Foot	Otamá.
Copaiba oil	Awá-tinaní.	Bow	Bigauahá.
Bark-canoe	Awa-safiný.	Arrow	Atú.
Lake	Dacú-fuá.	Oar	Waramí.
Yuca	Fou-ou-maunidí.	Knife	Zui-mazarú.
House	Zamí.	Cutlass (terçado)	Sara-sará.

The spelling (or the pronunciation) is as in Portuguese; this having been adopted in the 'Glossaria Linguarum Brasiliensum;' excepting that *w* has been used, where wanted; and *h* is an aspirate. The Arauá language is pronounced with tolerable distinctness, except with respect to *f* and *h*, which it is very difficult in some cases to distinguish.

Mandos, January 21*st*, 1869.

XIV.—*Narrative of an Exploring Expedition from Fort Vernoye to the Western Shore of the Issik-Kul Lake, Eastern Turkistan.** Translated from the Russian of P. SEMENOFF, President of the Physical Section of the Imperial Russian Geographical Society, by E. DELMAR MORGAN, F.R.G.S.

IN the latter half of September, 1856, the commander of the Alatau district informed me of his intention of causing a new, and this time a peaceable, reconnaissance in the Valley of the Chu.

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* See map in 'Journal of Royal Geographical Society,' vol. xxxi., p. 356.—ED.

It was necessary to find out the locality occupied by the wandering Sara-Bogus, and ascertain, as far as possible, the moral effect produced on them by the appearance of the first Russian detachment in the Valley of the Chu. The commander of the district offered me the direction of this reconnoitring expedition, placing at my disposal fifty Cossacks and the requisite number of pack-horses, camels, and Kirghiz guides. I accepted the offer with eagerness, as a reconnoitring expedition would give me an opportunity of exploring the Valley of the Chu, and I mentally resolved to cross the Suok Tiube, to reach the River Chu, and in returning to follow up stream the source of an affluent of the Chu, the Great Kebin, whose interesting longitudinal valley divides the west branch of the Trans-Ili Alatau into two parallel chains, north and south.

On the 21st of September, at 10 o'clock in the morning, the small detachment mustered in the square of Vernoye, near the New Church, then in progress of building. A mass was solemnly performed, and holy water sprinkled on the men, and at 11 we started. The weather was warm but hazy. The Alatau range (Trans-Ili), at the foot of which we were marching in a westerly direction, was hidden in mist. Rain soon began to fall. After about ten versts' march we crossed the little or Western Almatinka rivulet, whose frothy waves were hurrying down its rocky bed; and ten versts further on we crossed the little River Aksai, and seven versts more brought us to the River Keskelen. I rode with two Cossacks half a verst ahead of the detachment, the men of which were singing some melancholy air. Suddenly we heard fearful cries ahead of us. Galloping to an eminence in our front, we beheld an unexpected sight. A number of Kirghiz horsemen hurriedly detaching themselves from a group of people, whose cries had attracted our attention, with extraordinary swiftness galloped away from us. The group of people and pack-animals left by the plunderers were on the slope of another hill in front of us, in picturesque confusion. Some of the camels were lying on the ground, others stood unladen, some of the horses were tethered, others ran at liberty, and their loads, which had been ransacked, lay scattered on the ground. Of the ten Sarts (Tashkend traders) who composed the caravan, two lay on the ground bound, one old man was on his knees, and several, half-stripped of their clothes, ran to meet us with cries. My interpreters were behind with the detachment, and though we could not understand a word of the rapid utterances of the Sarts, their expressive gestures sufficiently explained the nature of the occurrence. A plundering band of Kara Kirghizes had been in the act of pillaging the caravan, binding the Sarts, undoing their loads, stripping and searching some of them, relieving them of the valuables they were carrying in their girdles, on their breasts, and in their boots, when a sudden interruption was put to their proceedings by the sounds of the distant Russian chorus which had reached them. For some minutes they had listened to the gradually approaching sounds, and then, seeing the leading files of our detachment, they jumped on their horses and galloped off, leaving the caravan, saved by our arrival, in the state of picturesque confusion in which we found it. The "baranta" men were thirty in number. The whole of our party soon came up. We were now close to one of the branches of the River Keskelen, where we had intended to halt after a march of twenty-six to thirty versts. Here we had agreed to wait for fresh horses to be collected for us by the Russian magistrate of the Kirghiz districts. As we had plenty of time to spare, I called for volunteers to follow the "baranta" men. Fifteen came forward, the remainder of the detachment bivouacked on the bank of the river. I joined the volunteers, and we gave chase to the marauders, though we were conscious of the great difficulty of overtaking them, from the fact of our Cossack horses being no match for those of the Kirghizes in speed. However, we did not lose sight of the retreating Kirghizes, or rather of some of them, for the unequal strength of their horses scattered them over some extent of ground; the strength of our own horses soon began to fail, and one after another our volunteers dropped behind and finally stopped. The pursuit terminated after sunset, seven of the hindmost Kara Kirghizes, after lightening their distressed horses by throwing away their arms, and even their outer clothing, were going at a foot pace, followed at considerable intervals by three of the pursuing Cossacks also at foot's pace. The Kara Kirghizes were looking round and apparently contemplating turning back, and falling on the Cossacks one by one. Notwithstanding the superiority of their arms, the Cossacks might have shared the fate of the Curiatii, and therefore determined to return, after collecting everything that had been thrown away by the Kara Kirghizes in their flight. It was late at night when we all regained our encampment.

On the 22nd of September, the weather having somewhat cleared, the mountains, whose tops were crested with the snow that had fallen the previous day, were now visible, our horses had not arrived. We left our bivouac and marched seven versts to the River Chemolgan, where we again halted, awaiting horses. After midday the weather again changed, and heavy rain fell till late at night. During the night our expected horses arrived, and with them some Dulat guides who had been to the Chu Valley and Buam Pass.

On the 23rd, very early in the morning, we started on our fresh horses. The mountains, along whose base we were marching, were obscured in a thick fog. Beyond the Chemolgan the plain at the foot of the hills, 3000 feet high, composed of alluvial deposits, and covered with pebbles, was intersected by a whole labyrinth of tolerably deep ravines. These ravines, in the rainy season, are washed out by mountain streams which bring down a quantity of light soil with them. It was on this broken ground, and in sight of the fort of Touchubek (afterwards destroyed), that Major Gutkovski, the commander of the first Russian detachment that had penetrated into the *Trans*-Ili district in 1850, was surrounded by numbers of the then hostile Dulats of the great horde, and was only able to retreat with his infantry to the River Ili by following the course of one of these ravines. After crossing the Kargala River, we marched for four hours to the River Ouzun Agatch, where we halted. The weather quite cleared, a wind dispersed the clouds, and by degrees the Trans-Ali Alatau, at whose base we were marching, now capped with snow, stood out to our view in all its majesty. The temperature was warm and pleasant; at 2 o'clock the thermometer showed 65° Fahr. The vegetation at our halting-place consisted of long grass, mostly burnt up and withered; some of the plants, however, were still in blossom, as, for instance, the tall wild hollyhock (*Althæa nudiflora*), *Lavathera thuringiaca*, the chicory-plant (*Cichorium intybus*), the liquorice-root (*Glycirhiza asperrima* and *Sophora alopecuroides.*) On the sandy hillocks there were also in blossom the *Pequanum harmala* and *Calligonum*. Leaving our halting-place, we reached, after 10 versts' march, the River Kara Kestek. The steppe beyond this river had been entirely burnt up for a distance of several tens of versts by a steppe fire, and presented a melancholy appearance, in contrast to which the effect of the setting sun on a perfectly clear horizon was magnificent. On our left, clearly traced out on the dark-blue sky, rose the outline of the (snowless) mountain range, from the end of which the rounded peak of the Suok Tiube majestically soared to a height of upwards of 9000 ft. (absolute height), brightly lit up by the last beams of the sunset, and adorned with broad bands of dazzlingly white autumn snow; two golden clouds were suspended at its very summit, whilst a few bright gilded clouds, and a dark one with a golden fringe, hung above the bright purple of the sunset. To the left, high above the hills, the pale yellow crescent of the young moon was visible. To the right of the Suok Tiube, two low mountain chains appeared behind one another on the clear background of the sky. Soon myriads of stars sparkled, by whose subdued light we marched two hours and a half more to our camping-ground for the night on the River Kestek, at the foot of the Suok Tiube, having accomplished 40 versts that day. It is almost useless to remark that Fort Kastek did not exist in those days, and was not even planned, so that we bivouacked in the open air on ground not less than 3600 feet high.

On the 24th of September, the thermometer showed 50° Fahr., weather clear and very fair. We commenced ascending the chain of hills, following up the winding stream of the Kestek, for the most part in a southerly direction. The mountain of Suok Tiube was on our right, and on our left the hills of Sari Chebir. After an hour's progress, the steep sides of the valley exhibited the first outcrop of hard mineral formations; first, dark limestone, then coarse-grained granite (its component parts were large crystals of rose felspar, light grey quartz in small quantities, and greenish mica, very much the colour of chlorite). The granite continued to be observable for four hours' march on both sides of the valley, losing at last its mica element. After five hours' ascent, the Kastek divided itself into two branches—we followed the lesser south-eastern branch of the river, as the greater or south-western branch passed too near to the Kokand fort of Tokmak. We soon came upon outcrops of hornstone. The ascent became steeper and steeper, and in a quarter of an hour we saw, amid the masses of granite, veins of porphyry. This porphyry, which was of a greyish colour, contained small crystals of red felspar, but was devoid of quartz. After another hour's march, we made a halt in a place where the porphyry was again of a different kind, dark, almost black in colour, and studded with bright grey crystals of felspar. When we recommenced our march, the weather began to change for the worse, and the dark-blue sky was obscured by clouds. We hurried to the top of the mountain pass, which our guides called Beiseninassy. At the very top of the branch of the Kastek by which we had ascended, the bare rocks were composed of gneiss, very rarely met with in either of the Alatau chains or Tian-Shan. This gneiss was coarse in grain, displaying very clearly its characteristic foliation, and was rich in mica. After these formations, we at last saw a pile of stones artificially arranged, into which dry branches were stuck, hung with different coloured rags—peace offerings to the spirits of the hills—for such the Kirghizes hold to be the summits of their mountain passes.

The rocks on the crest of the mountain pass were of porphyry-like granite, composed of bright red felspar, studded with crystals of the same, and grains of quartz. Vegetation here was withered, the thermometer stood at a little below freezing point, with a cold cutting wind. I could not measure the elevation of the summit of the pass; but I should say, from many observations and comparisons, that it was 7600 feet above sea-level. The view from the top was very extensive. Beneath us, as we stood, lay stretched the broad valley of the Chu, with its numberless silvery windings; unfortunately a branch of the mountains closing the valley on our right, prevented our seeing Fort Tokmak, situated just behind it, and not far from where we stood. On our left, the rocky valleys of the Great and Little Kebin opened out, adorned with the dark foliage of the woods scattered here and there over the rocks, and we could distinguish clearly the division of the Trans-Ili Alatau range into two parallel ridges capped with snow. A little further to the right was the dark and wooded fissure of the Buam Pass, and directly in front of us was a lofty wall of the range which is divided from the western extremity of the southern chain of the Trans-Ili Alatau, by the Buam Pass, and is known by the indefinite name of the Kirghiz-Alatau. Dark clouds picturesquely clothed the summits of the range, while here and there a solitary peak glistened in its snowy covering. Three-quarters of an hour's descent brought us to the wild narrow gorge of Beissenin-bulak, where we hoped to find a safe camping-ground for the night. However, darkness had overtaken us too soon, and the fall of one of our pack-camels into a pit, out of which we were fortunately enabled to drag it, compelled us to halt sooner than we intended, at an elevation of 6500 feet.

The 25th September, early in the morning, my tent was frozen. The mercury at 7 A.M. showed 30° Fahr., snow falling in large flakes. At 7·30 we started and went for two hours down a steep descent full of granite rocks and partially covered with the snow that had fallen in the night. After 3½ hours' march, the defile which we were following began rapidly to unfold itself to us, and we soon found ourselves in the broad valley of the Chu. Towards the end of the descent, the fall of snow had changed into light rain, which stopped as we entered the Chu valley.

A thick mist, which filled the valley, was also quickly dispersed as we pursued our seven versts' march in a somewhat diagonal direction across the valley to the point where the Chu escapes into this valley from the wild defile or gorge in the hills known by the name of Buam. The Chu valley was quite untenanted. The Sara-Bogus, in evident dread of an attack by the Russians, had left their encampments on the Chu, and we did not find the tracks of even solitary horsemen. Following the flat valley of the Chu, we crossed the little River Djinjishke-Karass, the dry rocky bed of the stream Djelanatch, and the little river the Lesser Kebin, and reached the small hill of Boroldai, situated almost at the very place where the Chu bends in a westerly direction as it issues from the Buam Pass into its broad valley. This hill consists of porphyry of a greyish violet colour, sparkling with crystals of quartz very evenly scattered over it. From Boroldai we directed our steps to the Buam Pass. This pass soon commenced to narrow so much, and the porphyry rocks rose so perpendicularly on the right bank of the Chu, and overhung it so much at times, that we found it impossible to proceed any further along this bank. We found it necessary to cross the Chu, but this was no easy matter; we rode repeatedly into its noisy foaming torrent as it dashed over rocks and down falls, but were as often obliged to return; our horses splashed by the waves, finding it impossible to resist the force of the current and keep their footing on the deep rocky bed of the river. At last a better ford was found, and in a compact body, with our baggage-animals in the centre, we were able to make a stout resistance to the current and cross the River Chu in safety. Our guides called the hills on the right bank of the Chu, Tooraigir, and on the left bank Enirgan. Both these hills are really part of the same range, abruptly divided, however, by the deep ravine of the Buam Pass, and form a continuation of the southern chain of the Trans-Ili Alatau, receiving further on the indefinite name of Kirghiz-Alatau, or, as it has lately been named more definitely, the Alexandrovsky Mountains. The Buam Pass astonishes the traveller by its wild magnificence. The narrow pathway, which only permitted us to advance in single file, now forced us so near the river that we were constantly splashed by its frothy waves; sometimes we were obliged to cling to the narrow projections of the porphyry crags, or to force a way over rocks and stones. On the adjoining cliffs were bushes of the *Hippophae rhamnoides*, *Halimodendron argenteum*, so characteristic of Central Asia, and the tree-shaped Juniper (*Juniperus pseudosabina*), well suited to the gloomy nature of the scenery, whose thick crooked stems lay for the most part on the rocks, but occasionally rose to a height of 18 feet, with a circumference of 10 feet near the roots. The dark-green foliage of this tree resembles that of the cypress, but differs from it in its strangely crooked stem and in its more widely spreading branches. After a very difficult advance of an hour and a half, we arrived opposite the mouth of the Great Kebin, which flows from the east, that is, the right side of the River Chu. The first glimpse of the mouth of this river convinced us that we must abandon our original plan of turning into the valley of the Kebin. This river, during the greater part of its course, flows through a beautiful valley of considerable width in places, dividing the Trans-Ili Alatau into two parallel chains, but at the last part of its course forces its way through a defile so narrow and rugged as to preclude all possibility of advance through it. The porphyry sides of this defile rise almost perpendicularly from the river so as to leave no space for a footpath along its banks; added to this, the River Chu is likewise so confined in its banks near its junction with the Kebin, is so deep, swift, and so full of rapids, that it was impossible to recross to its right bank. Our choice, therefore, lay between two alternatives, either to retrace our steps to the valley of the Chu or to follow the direction of the Buam Pass, which would lead us to the western shore of the Issik-Kul Lake. The greater number of my Cossacks entreated me to turn back, assuring me that we should inevitably come across numerous encampments of the Sara-Bogus tribe on the shores of the Issik-Kul; for, according to calculation, these people would hardly have had time to celebrate the funeral obsequies of their numerous dead, and the Cossacks drew lively pictures of the Kara Kirghizes' revenge, of which they had lately been witnesses. I, for my part, felt firmly convinced that to retreat would be no less dangerous than to advance. We had crossed the valley of the Chu at so short a distance from Tokmak that the Kokand patrols must have seen our tracks, which are easily distinguished by the Kirghizes, therefore an organized force might be awaiting us in our rear in the defiles of the mountain passes near Suok Tiube, which would be far more dangerous for us than hordes of the Sara-Bogus on the level shores of the Issik-Kul, whence, in the event of danger, we could always make a road for ourselves with our arms to the eastern extremity of the Issik-Kul and to the villages of the friendly tribe of Bogus; these considerations determined me on advancing. The valley of the Chu, or Buam Pass, became more and more wild and picturesque. Curious bow-shaped *crustacea* of coarse-grained conglomerate appeared on the blocks of porphyry, which porphyry was very similar to that of the Boroldai; farther on we saw some gneiss, which continued to be visible for an hour and a half; this was in its turn succeeded by the conglomerate, now, however, of finer grain, which lasted several hours. The cliffs and rocks of conglomerate were of remarkably fantastic shapes; for instance, one of these rocks stood quite alone and resembled a tall pillar widening towards its summit, as it were supporting a massive capital.

At half-past four in the afternoon we halted in a copse of willows and hawthorn (*Cratægus pinnatifida*). Among the trees growing in the valley we saw the poplar and the apricot. On leaving our halting-place the road became worse, and the sides of the pass higher and more precipitous; at length our pathway disappeared altogether on the very bank of the rushing, rapid river. The rocky cliffs rose abruptly from it, and left no footing. For some distance we were obliged to wade up the stream of the Chu, keeping as close as possible to the rocky walls, which were splashed with foam by the noisy river as it dashed over its stony bed; a little further on, the sides of the defiles were somewhat wider, and we gained some low rocks on the bank, which terminated in a level sward abruptly broken by a steep descent of five feet. Vainly we endeavoured to find an incline; we were obliged to make the leap on horseback. It required incredible efforts to force two of our camels to perform this feat, and we were compelled to unload them. The bed of the narrow valley was covered with innumerable stones of every size, from small pebbles to great monoliths; these were nearly all of porphyry, and have been detached at different times from the rocky walls of the defile. On three occasions we were ourselves witnesses of these avalanches of rocks in the Buam Pass as they came thundering down into the valley from the rocks above us, bringing with them a débris of small stones.

These phenomena are of frequent occurrence in all the great defiles of the Tian Shan. The night was darkening, and the valley lessening in size, and becoming more and more gloomy, and the porphyry side of the defile rising precipitously overhung the river, which, broken in its fall into a mass of foam and spray, leaped over the countless rocks that stayed its course. The track, which was now become almost imperceptible, led up a nearly perpendicular height for a few hundred feet, winding through terrible cliffs and along the precipices, at whose base the foaming river roared.

These pathways are known in the Altai under the name of *Bom*, which explains the name of the *Buam* Pass, and tends to prove that the country from the Altai Chu (the well-known affluent of the River Katúna) to the Tian Shan Chu, formerly an affluent of the Jaxartes (Syr Daria), now however no longer flowing into the latter river, but losing itself in the steppe lakes of the dry barren desert, was at some former time peopled by a race speaking one language.

It was twilight when, after great labour, and after unloading the pack-animals and dragging the baggage ourselves, we accomplished this perilous part of our journey. Fortunately for us the wind dispersed the clouds, and by the light of the young moon we saved our packs and our animals from destruction.

Our horses were so exhausted by their efforts in crossing the

Bom that they could go no further, so having descended the Bom we encamped for the night on the bank of the Chu.

We selected for our camping-ground a copse of willows growing at the bottom of a deep valley, shut in on one side by porphyry rocks, which rose to a height of 2000 or 2500 feet above the river, and on the other side by the river itself. In this confined but level space we had to find room for a tent, our baggage, upwards of fifty men and seventy animals.

The gusts of wind, at times increasing to the violence of a gale, had by midnight cleared the starry sky, of which we could only catch a glimpse, owing to the narrowness of the defile. The night was cold, and my wet tent, hurriedly stretched between two willows, was frozen by the morning. We did not venture to make fires, owing to the proximity of the Sara-Bogus, so I placed vedettes on the nearest rocks.

At one o'clock, A.M. the vedettes gave the preconcerted signal of danger; we all jumped to our feet in silence, and grasped our guns and pistols; the stillness of the night was only broken by the occasional cocking of guns, and we prepared for an immediate attack of the Sara-Bogus.

It could not be said that the locality we had chosen for our encampment was free from danger; though our position rendered a sudden attack impossible, still we were in peril of being crushed by boulders and stones thrown upon us from the heights.

I rushed from my tent to the foremost vedette to learn the cause of the alarm, the watchmen silently pointed to an eminence above us, from which small stones and shingle were being detached from the soil and rolling upon us, and from whence we heard an occasional whistle. The moonlight soon enabled us to distinguish a body of men and animals passing along the ridge of the hill, not less than 1000 feet above us; doubtless these were Kara Kirghizes, and in the moonlight they could not help seeing our bivouac. Added to this, the pathway along which we had come was the only one in the defile, so that, in order to avoid us, they were endangering their lives by scaling the steep hill-side. For about an hour we listened to the movements of the men, who led their horses by their bridles; at length all was still. It was clear to me that the band of Kara Kirghizes was a numerous one, and had come upon us unintentionally; but as they could not but recognise us as Russians by our tent and by the arms of our watchmen, our apprehensions were, that, warned of our approach, their countrymen would be fully prepared to give us a hostile reception. Fatigue and drowsiness, however, asserted their rights, and when we awoke on the following morning a fresh bright day had already dawned. On the 26th of September we left our bivouac at 7 A.M., and forthwith crossed a Bom, which seemed less rugged than that of the day before. After half an hour's journey we passed over the Terek-ti, an affluent of the Chu, beyond which the wide defile, as it gradually opened out, became a broad valley, which our guides called Sari-dala (yellow valley). The minerals here were the same porphyries as before; but at Ala-bash (speckled-head) a very curious stratum was visible, forming a considerable outcrop on the left bank of the Chu, of vertically placed, though of course not regular, tubes, intersected at intervals by horizontal divisions. All this was composed of tolerably hard clay. On the right bank of the river rose conical hillocks composed of white clay. Two hours after leaving Ala-bash, we halted at the boundary of Kok-mouynak, at a small grove of willows and *Hippophaë rhamnoides.* Here, for the first time for three days, we lit a fire and drank tea. At half an hour's journey from this halting-place we crossed an affluent on the left bank of the Chu, which our guides called Outch-kuriukel. From this point the valley of the Chu became still wider, and changed from a meridional to an eastern and western direction. The hills were lower and more like terraces, horizontally placed, and composed of the characteristic conglomerate, which forms the whole bed of the Issik-Kul: that is to say not only at the shores of the lake but also at the foot of the Tian-Shan and Trans-Ili Alatau on the Tierské and Kungé (north and south shores of the Issik-Kul lake). This conglomerate is composed of large grains of quartz, and studded with innumerable small pebbles of porphyry, granite, diorite and other minerals. The whole of this conglomerate is so friable that it is sometimes reduced to powder by friction, and can as easily be worked by adze or pick-axe as the tufa of the Grotto of Pozilippo near Naples. The breadth of the valley, the somewhat less rapid course of the still impetuous Chu, and the now even bed of the river, enabled us to cross from its left to its right bank, where we came into thick underwood composed of willow, hawthorn, *Halimodendron argenteum, Lycium,* &c. Half an hour later we ascended a hill and came quite unexpectedly on some Kirghiz yourtas (tents) situated on its further slope.

Six women and girls with some children ran to meet us, and threw themselves at our feet imploring mercy. I never witnessed before such terror, such death-like pallor on living faces. The women recognized us as those very Russians with whom their fathers and husbands had so lately fought so desperately, and considered themselves lost. I could hardly convince these wretched people that neither their lives nor property were in danger, and that we were peaceable guests on our way to pay our respects to their manaps (Sultans) Umbet-Ala and Djantai.

It was some time before the Kara Kirghizes were re-assured, and it was only after receiving presents from me of variegated kerchiefs and silver coins that their fears were allayed. The small village was composed of four yourtas; all the men, on seeing our arrival, had got on their horses and galloped off to the hills, with the exception of one old fellow, who, having no horse, had gone off on a cow. We had no difficulty in overtaking him; at a couple of hundred yards from the village the cow was found behind a rock, but its rider had hidden himself in a deep hole in the ground, out of which we could hardly drag him. By him we were informed that the Sara-Bogus, after their fight with the Russians, had migrated to the shores of the Issik-Kul, and that innumerable villages (auls)* of the Sultans (manaps) Umbet-Ala and Djantai, covered the south-western shore of the lake, and that Tiuregilde, so noted as a baranta chief, was on the Kashgar River (Upper Chu).

It was no time for delay, as the escaped horsemen might raise the alarm about us in all the encampments of the Sara-Bogus. Profiting by the roads, which were now not bad, we quickly rode to the shore of the Issik-Kul, but thirty versts distant. After two hours' riding the hills opened out still more, and passing the bend in the Chu, where the river after a north-easterly takes a westerly direction, we arrived at the broad western shore of the Issik-Kul, called here Kutemalda. To our right we could distinguish very clearly the valley of the Tian-Shan, from which the Upper Chu, known by the name of Kashgar, was struggling. On its exit from this lovely valley, the river, still continuing its N.N.E. direction, takes the name of the Chu, only separated from the lake by two low ridges, which terminate on the shore of the lake in undulating ground, the river here takes a sudden turn to the west in the opposite direction to the lake, and begins to force its way, through the high land to the west of the Issik-Kul, finally entering the Buam Pass. At the bend just mentioned the river is not more than seven to ten versts distant from the lake.

On the outside of the curve is a small marsh, probably fed by the waters of the Chu, and from the marsh a tiny rivulet flows to the lake, in the latter part of its course more like a dike made for artificial irrigation. This stream, so shallow and insignificant is it, bears the ironical name of Kutemalda. This is the only indication, at least at the present day, of any communication said to exist between the waters of the River Chu and the Issik-Kul lake, which lake was considered by former geographers (Ritter and Humboldt) as the source of the Chu.

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* "Aul," a Kirghiz word, signifying a temporary village or encampment.

When we left the bend of the river and went towards the lake, the view of the surrounding country was splendid. Before us stretched the vast expanse of the beautiful lake, and to our right, along its southern shore, the gigantic range and glittering snowy summits of the Celestial Mountains (Tian-Shan). The whole shore of Issik-Kul and the slopes of the Tian-Shan, were studded with numberless habitations of the Kara-Kirghizes. The entire tribe of the Sara-Bogus seemed to have assembled there. We were forced to make a road for ourselves from the bend of the Chu to the lake through countless herds of cattle belonging to this tribe. This was a sure sign that the Sara-Bogus had not been warned of our approach either by the first band who had passed close to our night encampment in the Buam Pass, or by the inhabitants of the first village we had come upon, for the Kirghizes, when in expectation of unfriendly visitors, are always in the habit of driving their herds off to some of the most deserted mountain defiles, to guard against a raid. The Kara-Kirghiz herdsmen were completely taken aback at the appearance of the Russian detachment, and did not know where to go or what to do.

To prevent any inopportune skirmish, I sent one of my interpreters in advance with two Cossacks, to tell all the Sara-Bogus they met that we were on our way to visit their manap Umbet-Ala. We reached his dwelling very soon. A large-sized yourta, ready stretched, seemed approaching us, as it ascended an inconsiderable eminence. It was dragged by a number of Umbet-Ala's slaves, who were inside the yourta. It was thus that our late enemies, who as we subsequently found out were preparing a celebration (asch) in honour of their warriors slain in fight with the Russians, met us with a friendly instead of hostile reception. The Cossacks could hardly believe their eyes, and were certain that this show of friendship was a cloak for treachery. The explanation, however, was simple enough; firstly our arrival was so sudden and unexpected that it seemed as if we had fallen from the clouds; next the Kara-Kirghizes are very scrupulous in observing the rights of hospitality, and admit the representatives of hostile tribes to the races and games which form part of their ceremonies and national holidays.

Our party was certainly too numerous and well armed to be taken for guests, but for this very reason the Sara-Bogus, independently of other influences, feared us more than we did them, suspecting that at no great distance were other Russian detachments. In proof of their fear, their head manap Umbet-Ala and the manap Djantai had, as we afterwards learned, concealed themselves at the furthest extremity of their encampment, lest we should seize their persons. I was received by the uncle and two brothers of the chief manap.

Umbet-Ala, the head manap (Sultan) of the Sara-Bogus, was the son of Urman, so celebrated for his successful raids and barantas of constant occurrence on the Issik-Kul before the Russian advance into the Trans-Ili country. Urman was killed in one of these fights with the neighbouring tribe of the Bogus, with whose manap or chief, the old Burambai, he was closely connected by family ties, his beautiful and good daughter having married Burambai's son.

The history of the bloody fray between the tribes of the Sara-Bogus and the Bogus is interesting, not only from its resulting in the subjection of the latter, and, a few years later, of the former tribe to Russian dominion, and in its thus making the Russians masters of the beautiful basin of the Issik-Kul, but also in the characteristic illustration it affords of the relations of Central Asian tribes with one another.

The first *casus belli* between two tribes is generally a quarrel between individuals. These quarrels frequently arise from some such cause as the buying, selling, or paying for goods, or sometimes from difficulties about the landmarks dividing the territory of two neighbouring nomad tribes. Quarrels respecting property among the Kara-Kirghizes are settled by their own magistrate (bey). These functionaries are generally men who have been invested by the Kirghizes, of their own free will, with a certain authority, and are publicly recognized as Ministers of Justice. The litigants have recourse to either one or the other of these functionaries, who investigates the case and fines the offending party for the benefit of the injured; the fine is paid in sheep, which are the currency of the country, and answer to our roubles. The decision of the justice is generally strictly adhered to, but appeal is allowed from such decision to the manap. The manap has only an intermediate power of jurisdiction, and refers the matter for reconsideration to the nearest justices, whose decision is final. If the litigants belong to different tribes, they prefer their complaints to two different manaps, and the case can then only be finally decided by the manaps and justices of the two tribes in Session. In such cases jealousies between rival tribes very often prevent their respective justices from arriving at a collective decision. The offended party in such case carries out by force the first decision of the justice by seizing, with the assistance of his friends, the number of cattle fixed upon as the penalty due by the other.

The number seized is, however, seldom limited to the amount of the fine, and the consequent sufferers retaliate in a similar way, that is, by a baranta or raid. The quarrel is considerably aggravated by the fact that the cattle seized on these occasions is rarely the property of the offender, but generally the first that comes, and that these forays are generally attended by some fighting and loss of life. Men's lives are valued at a certain number of sheep (upwards of 100 head); every tribe keeps an exact account of its losses, and continues the baranta until it has fully retaliated by inflicting proportionate loss on the enemy; but, as it is difficult to equalize exactly the losses on either side, a baranta very often grows into a regular war (djoù). The Sara-Bogus and their intimate allies, the Saltús, hold the lesser western portion of the Issik-Kul basin, all the valleys of the tributaries of the Upper Chu, and of its two principal branches, the Kebins, as well as that of the Chu or Kashgar; the Bogus the greater eastern portion of the Issik-Kul basin, the Upper Tekes and Naryn. The numbers of the Sara-Bogus can be roughly estimated at from 80,000 to 90,000 of both sexes, the Bogus 60,000 of both sexes. I am told however, that before the commencement of the feud between the two tribes, the Bogus were more numerous than the Sara-Bogus. In 1853, when the war broke out between these tribes, victory almost always declared for the side of the brave and enterprising Urman.

The Bogus lost the favourite camping-grounds of their old chief (manap) Burambai on the Kizil-Ungur, the greater portion of their pasture lands, and were obliged to evacuate the whole of the Tierskè (south shore of the Issik-Kul), succeeding only in keeping a footing at the eastern extremity of the Issik-Kul and the north-eastern portion of the Kungè (north shore of Issik-Kul). Urman, then flushed by success, resolved to finish the war by a *coup de main* of the *aul* and family of Burambai. So bold a design could only be successful if sudden in its execution; Urman therefore, leaving his main force behind, made his attack with not more than 600 horsemen. This time, however, good fortune deserted him. He certainly seized the *aul* of Burambai, but was surrounded on all sides by the Bogus. A sanguinary fight took place, on a dark night, on the banks of the Shata on the Tierskè. Urman surpassed every one in strength and bravery, but found his match at length in Klitcha, the nephew and adopted son of Burambai, whose fierce and bloodthirsty disposition gained him afterwards the sobriquet of the "Issik-Kul tiger." Both displayed prodigies of valour, but Urman, at length mortally wounded by a lance, was carried from his horse to the yourta of Emirzak, Burambai's son, and died in the arms of his wife, Urman's own beloved daughter.

Emboldened by the death of Urman, the Bogus collected all their forces, and marched to the Tierskè; Umbet-Ala, Urman's eldest son and heir, armed all his followers and marched to meet them.

The hostile forces met on the Tierskè, but were separated by a deep and rapid mountain stream, which neither ventured to cross in the face of the enemy, and thus begin the attack. In vain the warriors on either side rode daily down to the bank of the stream, and in Kirghiz fashion endeavoured to taunt and jeer the enemy into action. More than a week passed in inactivity. Umbet-Ala then had recourse to stratagem. One dark night he left his bivouac, leaving his brother with a few hundred horsemen, and giving him instructions to light the bivouac fires every night the same as before, while he marched round the lake, and on its northern shore (Kungè) came upon the defenceless *auls* of Burambai, situated then at the mouth of the river Tiube. The *auls* were deserted by every one, except the women, children, and herdsmen, so that Umbet-Ala was able to seize, besides countless flocks and herds, the greater number of the children and women of Burambai's family, and among the latter his own sister, Emirzak's wife. Terrible was the alarm created in the camp of the Bogus by the intelligence brought to them by Burambai's slaves of the raid on his *auls*. Burambai, with all his forces, rushed to the rescue, but found his village sacked, and his family carried off into captivity, and went in pursuit of the Sara-Bogus along the Kungè. The latter, however, were already at home, and Klitcha, Burambai's nephew, only succeeded in making prisoners of fifty of the enemy's horsemen, who were covering their retreat. These he mercilessly put to death. Umbet-Ala again took the field. On the north-eastern shore of the Issik-Kul a bloody fight took place; the Bogus were defeated, and retreated hastily to the Tekes and Karkar, with all their remaining tents and herds, after entrusting all the valuables they had left to the care of their honest neighbours the Calmucks, fearing a fresh attack of the Sara-Bogus.

The old Burambai, who wore a red ball on his cap, in token of his rank among Chinese mandarins, implored the assistance of the Chinese authorities, but to no purpose. The latter, who had for some years discontinued their customary expeditions to the Issik-Kul, had no further intention of protecting their subjects. This forced Burambai to subject himself completely to the Russians, which he had before evinced his willingness to do. He paid a heavy sum to ransom his relatives, but Umbet-Ala refused to allow his sister to return to a family one of whom had killed his father. However, the high-spirited sister of the manap thought otherwise; she considered she would better honour her father's memory by the heroism with which she fulfilled her duties, than by treachery to the race to whom her marriage had, with her father's consent, allied her.

After staying some months at her brother's she was less carefully watched, and at last escaped with one of her fellow prisoners, also a wife of one of the Bogus. These poor women took only a little millet with them, to preserve themselves from dying of hunger, and went along the southern shore of the Issik-Kul, but fearing pursuit by the Sara-Bogus they made their way for seventeen days over the most inaccessible crags and defiles of the Tian Shan, supporting themselves entirely on the millet they had taken, and upon wild roots. At last, faint, half-starved, shoeless, and with their feet cut by the sharp rocks, the two Kara-Kirghiz women safely reached their husbands on the Tekes. Urman's daughter subsequently exerted all her influence to put a stop to the sanguinary struggle between the two tribes; but failed in gaining her point, till the Sara-Bogus, worn out by their long dissensions, and convinced of the fruitlessness of their efforts against the Bogus, now under Russian protection, determined themselves to become Russian subjects two years after the date of my visit.

When I had taken possession of the yourta (tent) placed at my disposal, Umbet-Ala's old uncle and youngest brother made their appearance. They explained that the chief manap (Sultan) had gone to the River Kashgar, to make preparations for the asch (funeral obsequies), and with evident uneasiness questioned me as to the cause of my arrival, and whether other Russian forces were at hand. I explained to them that I had come from afar,—from the capital of the great Ak-basha (the white Czar) to see the Issik-Kul and Mustag (the snowy range, *i. e.*, Tian Shan), and, having heard of the feud that existed, I was anxious to see the mode of life of the Sara-Bogus, and to know the reason of their attacks upon Russian caravans, and upon the Kirghizes under Russian protection. I then told them that the white Czar likes his subjects to live peaceably with one another, and on good terms with their neighbours; that he never allows his subjects to be plundered, and always punishes the delinquents, in whatever part of the Empire they may be, and that even the depths of the Issik-Kul cannot conceal them; but that if the Sara-Bogus chose to live peaceably with their powerful neighbours, the Russians would not molest them. Umbet-Ala's uncle afterwards told me of his journey to Pekin, towards the close of the last century, with offerings to the Emperor of China (the Sara-Bogus discontinued their allegiance to China, and became subject to Kokand towards the middle of the present century), and prefaced his narrative by saying that the Sara-Bogus were dissatisfied with the Kokand authorities, who taxed them exorbitantly, and had already contemplated offering their allegiance to Russia; that it was they who destroyed Russia's bitter enemy, the celebrated Kenissar Kasimoff, Sultan of the middle horde of the Kirghizes; that if they were now hostile to Russia it was at the instigation of wicked men, such as the Kokand authorities, who incited them to marauding expeditions on Russian territory, and, worst of all, the manap Turegilde, who lived by plunder, and was on bad terms even with Umbet-Ala. I gave presents to the family of Umbet-Ala, and left a handsome gift for the manap himself. The Sara-Bogus gave us several oxen and horses, which were most acceptable, because they replaced some of our horses which we had been compelled to leave on our road. Notwithstanding all this, we took every precaution for the night, in case of an attack by the Sara-Bogus; our arms were prepared, and our horses saddled, and patrols doubled.

On the 27th September, at 7 A.M., the thermometer showed 37° Fahr., the temperature of the lake at this time was 42° Fahr.; before dawn, however, the temperature of the atmosphere was below freezing-point, for the small pools near the lake had a thin coating of ice. As we remained there for the day, I employed my spare time in surveying Kutemalda and the shores of the lake. The Issik-Kul Lake lies in a broad basin or valley between the Celestial Mountains (Tian-Shan) on the south, and the Trans-Ili Alatau on the north; the length of this basin, bounded by gigantic hills from the entrance of the Chu into the Buam Pass on the west, to the Santash Pass on the east, is 250 versts (167 miles), its breadth from the southern slope of the Trans-Ili Alatau to the northern slope of the Tian-Shan is from 70 to 80 versts (50 miles). The lake occupies the deepest part of the basin, and is 180 versts (120 miles) long (from W.S.W. to E.N.E.) and 50 versts (33 miles) broad, with a superficies of about 4000 square miles. Between the shore-line of the lake and the base of the hills surrounding the valley is a margin of from 10 to 20 versts (6 to 14 miles) in breadth, of level or slightly undulating ground. The northern shore of the lake is known as Kungè (*i. e.*, slope turned towards mid-day), and the southern shore as Tierskè (*i. e.*, slope turned towards the north). The Kirghizes of the Issik-Kul have named the Trans-Ili Alatau, the Kungè-Alatau from the former; but, as this word only applies to the southernmost chain of the range, we exclude it from geographical nomenclature, as we do the indefinite name of the Kirghiz Alatau which has been given by the Kirghizes to the spurs and foremost chain of the Celestial Range (Tian-Shan) on the Tierskè and west of the River Chu. I determined the height of the Issik-Kul, by the temperature of boiling water, to be 4540 feet above sea-level. This is the average of several observations I made at both ends of the lake. Goloubieff pronounced it to be 5300 feet by barometrical observation, but I consider this excessive, and by taking the average between our calculations the height of the lake can hardly exceed 4900 feet.

The Trans-Ili Alatau rises on the Kungè side to an average height of 5500 to 6500 feet above the level of the lake, or ten to eleven thousand feet above sea-level. In the middle of the range alone, for a distance of from 50 to 60 versts (about 40 miles), the altitude is from 12 to 14 thousand feet, and the mountains enter the line of perpetual snow, which, however, on the southern slope of the hill is by no means a continual covering, and the remaining peaks of Alatau have only patches of perpetual snow on them, hence the appearance of the whole range from the Issik-Kul side perfectly answers to its name of the speckled or piebald hills (Alatau).

The Trans-Ili Alatau rises so abruptly from the Kungè as to have no chain of hills in front of it, but only a few spurs, which are hardly visible from the Tierskè side of the lake, and is intersected by a few transverse valleys through which small but impetuous streams rush down from the snow-line over rocks and stones to the lake. In one place only does one of these spurs approach so close to the lake as to leave hardly any room for a road to pass between it and the lake. The wood here is called Kesè-Sengir. The wall-like appearance of the Alatau is still more marked owing to the absence of any important fissures in its side, and the great height of its mountain passages in comparison with the average height of the range itself.

Very different is the appearance of the Celestial Range (Tian-Shan), which rises from the Tierskè to an average height of 10 to 11 thousand feet above the lake, *i. e.,* 15,000 to 16,000 feet above the sea-level.

The slope of the Tian-Shan, though rapid, is not so abrupt as the slope of the Alatau, so that the front chain and spurs are distinguishable enough and bear the character of individuality, and when the Tian-Shan is looked at from its base on the Tierskè, partially hide behind them the snow-clad giants of the principal range; the latter, however, are visible above it wherever the front chain dips and at the heads of the deeply indented valleys. However prominent the front chain and spurs of the Tian-Shan are, their connection with the principal range running from E. to W. is very evident on looking at the Tian-Shan from Kungè. From here the appearance of the range is an endless row of gigantic peaks in an unbroken covering of snow; in fact, if it were possible to follow along the ridge of the Celestial Mountains from the source of the Kashgar (River Chu) to the magnificent group of the Khan-Tengri and the Mussart Pass, that is, along an extent of the 400 versts of the Tian-Shan, with which I am acquainted, the traveller would hardly leave the snow-line more than six times, namely, at three of the passes which barely reach the snow-line, or an elevation of 11,500 feet, and three times in crossing the beds of rivers which take their source on the north side of the Tian-Shan, and force their way through the range to its southern side.

It would be difficult to imagine anything more splendid than the view of the Celestial Mountains from the Kungè or north side of the lake. The dark-blue surface of the Issik-Kul, with its sapphire-like colour, may well bear comparison with the equally blue surface of the Lake of Geneva, but its expanse—five times greater than that of the latter—and seeming almost unlimited looking from the west end of Kungè eastward, together with the matchless splendour of its background, imparts to it a grandeur which the Lake of Geneva does not possess. Instead of the Savoy Alps rising immediately from the Lake of Geneva, and completely concealing the noble group of Mont Blanc—the unbroken, snowy chain of the Celestial Hills stretch away for at least 200 miles of the length of the Issik-Kul. The sharp outlines of the spurs, and the dark furrows of the valleys in the front range, are softened by a thin, transparent mist which hangs over the lake, but which heightens the clear, sharp outlines of the white heads of the Tian Shan giants, as they rise above it and glisten in the sunlight on the azure-blue canopy of a Central Asiatic sky. The line of perpetual snow commences at three-fifths of the distance up the hills from the level of the lake to their summit, but the further east one looks the deeper their snowless base seems to sink beneath its surface, till in the far east the waves of the lake seem to be washing the snowy crests of the grand peaks of Khan-Tengri. The aspect of the landscape, however, is far less beautiful than that of the Swiss lakes; instead of terraces of gardens, flourishing towns and villages, and romantic castles and pretty Swiss châlets, the traveller finds nothing on the Kungè but a bare desert shore, devoid of everything which the hand of civilized man could implant; unfruitful, rocky, covered with pebbles, almost bare of trees, it is only the banks of the impetuous mountain torrents, and a few places on the shores of the lake that are wooded with here and there groups of small trees and tall underwood, consisting principally of *Hippophaë rhamnoides*, with its narrow, silvery leaves and branches laden with bright red fruit, of hawthorn, and two or three kinds of willow. Occasionally the white felt yourtas (tents) of the Kirghiz herdsmen are seen to peep out of these groves, and the two-humped camel stretches out its long neck, and still more rarely a numerous herd of wild boars rushes out of the forests of thick reeds which surround the copses, or the terrible inhabitant of these cane-thickets, the blood-thirsty tiger, springs from his lair. The shores of the Issik-Kul itself, from 10 to 20 versts (about 10 miles) distant from the foot of the hills, are not everywhere flat, but, on the contrary, in many places rise abruptly from the lake, though to no considerable height.

But from these cliffs or terraces the waters of the lake seem to recede as if contracted in their bed. The old or shore terraces of the Issik-Kul, as well as its bottom near the shores, are all composed of the before mentioned loose reddish conglomerate, the layers of which dip towards the basin of the lake, and on the other hand rise towards the foot of the mountains, which is all covered by the same conglomerate, visible on the surface in some of the ravines of the Tian Shan, at a height of several hundred feet above the level of the lake; as, for instance, in the Wood of Kizil-Ungur, where there are extensive caverns in the thick layers of the conglomerate. As these conglomerates are foreign to the palæozoic strata of the Tian Shan and Alatau, and as they form the bed of the lake wherever I was able to examine it, I conjecture that these conglomerates are the precipitated sediment of the lake itself. In such case their existence over the whole basin of the lake at a considerable height above its present level, proves that the lake in former times occupied a far more extensive basin. In confirmation of this theory the very nature of the Buam Pass may be cited; its origin could never be attributed to the present unimportant Kashgar, but must have arisen from the waters of the whole Issik-Kul having forced an outlet for themselves through it, and then rapidly subsided. So that for a length of time subsequent to this the River Chu may have had its source in the Issik-Kul, till, on the gradual sinking of the waters of the latter, the Kashgar, formerly its tributary, became the source of the Chu. The diminution of the lake can only be accounted for in the following way—viz., that its tributaries gradually drying up as the snow-line on the mountains became higher, owing to the increasing dryness of the climate of the continent, no longer supplied the deficiency occasioned by the evaporation of its waters. The Issik-Kul seems to be of very great depth—as far as I could ascertain there are no islands in it, its waters are brackish and unfit to drink—the lake never freezes, although its creeks and bays are in winter covered with ice, and owing to this fact the Kirghizes have called it Issik-Kul, in Chinese Dje-hai,—both names signifying the warm lake. The Mongols and Kalmucks call it Temut-Nor, which means the iron lake. The reason of the non-freezing of the lake must be the same as that assigned for the non-freezing of Lake Hoktchia in the Caucasus (which is one degree further south, though 1000 feet higher than the Issik-Kul), that is, its great depth and the height of the hills which surround it. The lake is full of fish, which collect in enormous quantities in its bays, and which the Kirghizes never catch. There is not much variety, however, in the kinds of fish; I have caught only carp there.

Forty small rivers fall into the lake. The most important of them are the Tiube and Dgirgalap on the east, taking their sources in the perpetual snow of the Tian Shan, but on leaving these hills flowing for upwards of fifty versts in a direction parallel to the Issik-Kul valley, and divided by the low ridge of Tasma, which forms a promontory into the lake between the estuaries of these two rivers, and is called Kuke-Kulussun. Of the remaining tributaries of the Issik-Kul, those on the south are more important than those on the north. The former include the Karakol, Djitiuguz, Kisil-su, Zauku, Chishkak, Ak-terek, Djirgachal, Sharpildak, Tain, Konurlen, &c.; the latter include the Taldi-bulak, Turaigir, Durenin-su, Chagan-ati, Kese-Sengir, Great and Little Aksu, Surekgir, Kudurgu, Kurmeti, &c. In winter all these rivers are ill supplied with water, but in spring and summer, and even in autumn, they are full of water, rapid and noisy, and are bordered by small woods. Wherever the soil is not too thickly covered with stones, and could be irrigated by turning the courses of these streams, agriculture could be successfully carried on and large crops produced; the arable land, however, is very limited in extent, and forms hardly more than a tenth of the whole of the land of the Kungè and Tierskè. Gardening, too, might be successfully prosecuted in all the valleys issuing out on to the Tierskè and Kungè, as is shown by Burambai's small garden in the valley of the Zauku and the plantation of apple-trees on the Aksu, or left branch of the Djirgalan. Grapes would hardly ripen on the Issik-Kul.

On the 28th of September, at 11 A.M., I started homewards, after bidding adieu to the hospitable Sara-Bogus. For the first eight versts we followed the shore of the lake in an E.N.E. direction, then we turned to N.E., crossing the Kungè diagonally, and ascending the rising ground towards the foot of the hills. The whole of the Kungè is covered with small round stones, consisting partly of common porphyry, diorite, and occasionally granite. The stony soil was thickly covered with prickly plants, such as the prickly kinds of *Astragalus*, *Lycium*, *Acanthophyllum spinosum*, and the newly discovered *apaniculatum*. After fifteen versts' journey across the stony slope of the Kungè, we reached the first hills or spurs of the Alatau; the first of these were composed of deposits, but further on, as they increased in size, I saw crystals of sienite, and among the sienites diorite and dioritic porphyry. After following for seven versts a tortuous pathway, we reached the small river of Turaigir-su and encamped for the night, taking every precaution against the Sara-Bogus, who, as soon as we had quitted their camp, ceased to regard us as possessing the sacred character of guests. Night, however, passed peaceably, and on the 29th of September we again started, not later than 7 A.M., for we had before us the difficult and dangerous crossing of the southern chain of the Trans-Ili Alatau, difficult and dangerous, at least for so late a season of the year.

From the Turaigir-su our course lay N.E. across the spurs of the mountains dividing this stream from the more easterly streams of Kizil-bulak, Kabirgir-bulak and Durenin-su. The strata on the Turaigir-su were red granite, but on the ridge there were traces of diorite.

After four hours' tedious ascent in a north-easterly direction, we at length, at about 11 A.M., came to the Durenin-su. Here our caravan was obliged to halt, for having come upon a herd of wild boars we were tempted to give chase. The sides of the small stream were encrusted with ice, on its east bank was a steep and high ridge of red granite, at the foot of which was a strip of marsh land where we came up with the wild boars. They rapidly disappeared, however, with the exception of a very large one wounded by the Cossacks, and unable to keep up with the others. He ran very quickly for a considerable distance, and left the pursuing Cossacks far behind. I was at length successful in overtaking him by following a more direct pathway in very rocky and difficult ground. My horse, aware of danger, trembled and jumped to one side, and I was obliged to dismount to avoid the possibility of being taken down one of the precipices along which the pathway led. Letting go the reins, I placed myself, revolver in hand, in front of the wild boar as he rushed down the narrow track to meet me, and getting on to a low piece of rock, I determined to reserve my fire till he came within a few paces. At about twenty paces from me the boar stopped, and then again rushed on. At this moment I heard several reports of firearms, and a bullet whizzed close to me. The boar still held on his course, but at a few paces from the stone on which I was standing he fell heavily in front of me, after the last shot which had broken his front leg. When I came up to him he could not move and hardly breathed.

He had been hit by seven bullets, nevertheless he continued to run, mortally wounded as he was, until the last shot broke his leg. This animal was of such an immense size and weight that we were obliged to cut him into pieces, and load the bullocks given to us by the Sara-Bogus with some of the best parts. It was 1 P.M. before we recommenced our march along the foot of the above mentioned ridge of red granite. On the opposite side of the stream were layers of gneiss. Our ascent became steeper and steeper; as long as we followed the course of the stream, our road though difficult was not dangerous, but when we left the stream on our left, and going due north commenced climbing by a narrow zigzag path the steep granite ridge which closed the defile, our progress became very dangerous. We were three hours ascending from the point where we had left the Durenin-su to the top of the pass; such were the difficulties and obstacles in our way, owing to the steepness and huge rocks of gneiss, thinly covered with snow, over which we had to climb.

In this ascent we were compelled to abandon a camel which could not ascend the pass as well as three horses which had been badly wounded by falls from rocks, and had it not been for the strong bullocks given to us by the Sara-Bogus several of our Cossacks would have been obliged to find their way back to Vernoye on foot. A piercing cold wind met us at the top of the pass called Dureninassi, and I should say (though I was not able to measure the elevation, but judging from observations I made on two other passes of the Trans-Ili), that this one could not be less than 9000 feet. The view from an eminence near to the summit of the pass to which I climbed, while waiting for the Cossacks who were behind re-adjusting the packs, was extremely grand and extensive. The sun was near the horizon, a light semi-transparent mist obscured parts of the Celestial Range—though its snowy peaks glistened splendidly in the sun's last rays.

The highest peaks seemed to be those in the meridian of the west end of the lake, and about its centre—between these two meridians the Snowy Range seems somewhat lower. The dark-blue surface of the west end of the lake lay spread out at the foot of the hills, with its bays and promontories like a map, widening towards the centre and decreasing towards the W. On the N., or rather N.E., of the pass, we could see the three-headed giant of the northern chain of the Trans-Ili Alatau—the snow-capped Talgarnin-tal-chek, whose approximate height may be from 14,500 to 15,000 feet. The descent of the Dureninassi was even more dangerous than its ascent. The first part of the descent is so steep and rocky, that it is difficult to believe it practicable for horses. There was a great deal more loose snow on the northern than on the southern slope.

It was impossible to keep one's seat on horseback, and we all descended on foot, holding our horses by their bridles; men and animals fell alike, and we all slipped down in glorious confusion. No serious accidents, thank God, occurred. Men and horses escaped with a few bruises, though half of them were bleeding after the descent.

This obliged us to halt in a picturesque valley half-surrounded (on the S. side) by a steep ridge of gneiss, from which we had descended. Towards the N. this amphitheatre opened out on to the deep valley of the Kebin, the same which divides the W. wing of the Trans-Ili Alatau for a distance of 100 versts into two parallel ridges, a northern and southern. To our left was the beautiful little alpine lake of Durenin-Kitchkené-Kul.

Having somewhat restored ourselves after our falls and bruises, and waited for the stragglers to come up, we continued our descent by moonlight down the still fearfully steep slopes. In two hours and a half more we reached the limit at which trees grow, and the northern Durenin-su, a noisy and rapid mountain stream rushing over rocks and down cascades, and descending a very considerable fall to join the Kebin. The wild romantic valley of the Durenin-su, is adorned by groups and clusters of the tall-stemmed silver-fir (*Picea Schrenkiana*). After a further descent of 1500 feet, we at length halted for the night in a beautiful spot. The weather, with three or four degrees of heat, was lovely. The moon shone out on the clear sky and silvered with its rays the tops of the hills, which contrasted with the dark narrow fissures of the defiles, impenetrable to moonlight; the dark silver-firs rose up above our bivouac as straight as arrows.

The fires were soon blazing for the first time since we crossed the Suok Tiube. The Cossacks were particularly gay, sang songs, prepared an excellent supper of the wild boar we had killed, and congratulated themselves on having escaped unhurt from what they termed the tiger's paws, so little faith did they put in the hospitality of the Sara-Bogus. Our camp-fires burnt all night, as two of the Cossacks were missing; we had no reason, however, for alarm about them, and their companions laughingly assured me that they would be back by dawn; and certainly when I awoke the following morning they were all there, and were drinking merrily together some vodka (corn brandy) brought by the two missing Cossacks from Vernoye, from which our camp was 50 versts distant across the nearest Almati pass of the northern chain of the Trans-Ili Alatau. Our camp on the Durenin-su was on somewhat higher ground than at the junction of this stream with the Kebin, and proved to be at an elevation of 5962 feet. And therefore the bottom of the valley of the Kebin, at the point where the Durenin-su joins it, must be about 5500 feet. Immediately above our encampment the steep mountain's side rose to a height of 2000 feet, the outcrops of minerals consisted of slate of a greenish grey colour in layers running straight from E. to W. but with a dip of 65° towards the N. At 8½ we left our bivouac, and half an hour later reached the Kebin. The valley of this river is ½ a verst in breadth at this point, a broad belt of silver-firs runs down into the valley from the northern slope of the southern chain. The Kebin, a noisy rapid stream, is from 50 to 56 feet broad at this place. After fording the river, we commenced our ascent of the northern chain of the Trans-Ili Alatau. The mineral outcrops were the same slates as before, in almost similar layers from E. to W. (diverging 5° from that direction towards E.S.E. and W.N.W.), but with a dip towards the S. at an angle of 53°. The synclinical fall of the layers in the Kebin valley clearly proves that the range rose simultaneously in two parallel lines. With regard to the geological epoch of the formation of the slates of the Kebin valley, these are very old and palæozoic, and though, owing to absence of fossils in them, I was unable to determine the formation to which they belong, yet I place them in one of the two oldest palæozoic epochs, and this opinion is confirmed by the fact that in the eastern wing of the Trans-Ili Alatau, between the two chains, these slates are found below limestone containing fossils of the Devonian formation, which are in their turn below layers of mountain limestone (the coal formation). Our ascent from the valley of the Kebin to the mountain pass of Keskelen occupied 5 hours. After the outcrops of slanitz we very soon came to outcrops of light-coloured, coarse-grained granite, in steep cliffs. The transverse valley which we were following in our ascent of the northern chain of the range, rises abruptly to a steep granite ridge; along this valley rushes a mountain streamlet, whose edges were thickly covered with ice from its source; the last portion of the ascent leads up to a steep ridge more than 1000 feet above it—this ridge is composed of two kinds of coarse-grained granite, a light-coloured and a red-coloured; on the borders of the two is a narrow zigzag pathway, at first over bare rocks, and then over rocks covered with light snow.

The pass forms a cutting in the narrow ridge, the nearest summits of which are not more than 300 to 500 feet above the highest point of the pass, which is itself 10,400 feet above sea-level. To the left (W.) of the pass rose perpendicular cliffs of light-coloured granite, connected together by a narrow saw-shaped ridge; to the right (E.) a somewhat rounded peak of red granite, to the top of which I climbed on foot without much difficulty, and from which I could look in an easterly direction along the rugged ridge covered with snow wherever it was not too steep for it to lie. Under the light freshly fallen snow, and especially on the northern slope of the ridge, were visible the layers of perpetual snow formed into ice, but in fields of small extent, mere specks in appearance from below. The view from the summit of the pass could hardly be surpassed by the celebrated view from the Faulhorn in the Swiss Alps.

All round, but especially on the S., S.E., E., and N.E., rose the sharply pointed peaks, whose dark rocks contrasted forcibly with the dazzling whiteness of the snow covering the less steep parts, and this contrast fully accounted for the name of the speckled hills (Alatau) given to them by the inhabitants ages ago. Through the opening in the Trans-Ili Alatau could be seen, glistening through the mist on the other side of Issik-Kul, the hoary-headed giants of the Celestial Hills.

The surface of the lake itself was, of course, invisible. To the N., looking through the narrow wild Keskelen Pass, the eye ranged over the boundless plains of the Ili Steppe. The descent was more difficult than the ascent, snow and rocks were intermingled on the northern slope of the hills in chaotic confusion. The icy crust of perpetual snow added still more to the difficulties; our horses, led by the bridles, slipped and fell at every step. At the termination of this steep descent, I came on two veins of diorite; the second of these attracted my attention, owing to its loosely formed texture, and to the fact of its containing green crystals of hornblende. We here came to one of the sources of the Keskelen, frozen at this time of the year, and went along a valley in a diagonal direction, with the range, *i. e.* N.E., and with a moderate decline. This valley was on the borders of the upper alpine zone and the zone of the alpine underwood; at an altitude of 9000 to 9500 feet, on its slopes, grew the *Juniperus pseudosabina*. After continuing for 20 minutes along the valley, another steep descent commenced; at a height of 8000 feet were some graceful silver-firs through which two branches of the Keskelen rushed. One of the valleys of these branches flowing in a S.W. direction was extremely pretty, closed in by snowy peaks, one of which reminded me, in shape, of the Wetterhorn in the Alps. The valley of the Keskelen beautifully decorated with vegetation, became very pretty and romantic. After 2½ hours' descent from the summit, we stopped for the night at a wood of silver-firs, at an elevation of 6000 feet.

On the 1st Oct. we started before sunrise; for 15 versts from our bivouac our road led along the Keskelen valley, through the hills, and for 5 more through the outlying hills of the range. The first 8 versts led us through woods of silver-firs; in places the pathway was overhung by rocks of red granite.

Further on, as we left the little valley of the right branch of the Keskelen, the granite ended, and was replaced by grey sienite and diorite, and the silver-firs disappeared. We now entered the zone of apricot trees, that is, were below an elevation of 5000 feet; 12 versts from our last camping-ground, the sienite finished. Three versts further on we left the great hills, and reached the hillocky ground at the foot of the Alatau. The hillocks here are covered with alluvial deposits, and stones of greater or less magnitude, sometimes of enormous size, of granite, sienite, diorite, and dioritic porphyry. Two versts from the principal range the Keskelen forces a way through the outlying hills by a very narrow defile, whose steep sides are composed of reddish-violet coloured porphyry, supporting and strangely metamorphising layers of siliceous slate. These layers run E.S.E. and W.N.W., only 10° from parallel and with a dip towards the N. After going through the defile, we entered the plain at the foot of the hills, turned to the east, and, 30 versts further, reached Vernoye in safety.

XV.—ASTRONOMICAL POINTS fixed by C. V. STRUVE in TURKISTAN, from 1865 to 1868.

Communicated by M. ALEX. DE BERG, Consul-General for RUSSIA, in LONDON.

NAMES OF PLACES.	Latitude.			Longitude to the east of Pulkowa.		
	°	′	″	°	′	″
Turkistan (town)	43	17	40	37	57	19
Uch-Kayuk	43	13	34	37	29	49
Coal Pits on River Bugun	43	2	57	39	32	9
Aùlièta	42	53	44	41	3	34
Fort Merkè	42	52	20	42	49	19
Fort Tokmak	42	50	25	44	54	37
Ak-su	42	50	20	43	46	50
Chemkend	42	18	8	39	16	19
Tashkend	41	18	40	38	56	49
Fort Chinaz	40	56	2	38	26	34
Fort Keleuchi	40	53	53	39	9	0
Khodjend	40	17	2	39	17	20
Fort Naù	40	9	7	39	2	30·5
Jizakh	40	9	5	37	28	28
Village Kairagatch	40	3	20	39	24	6
Fort Zaamin	39	58	4	38	2	42
Oura-Kube	39	55	16	38	38	23
Yany-Kurgan	40	6	50	37	11	50
Samarkand	39	38	45	36	38	54
Bokhara	39	46	45	34	7	*

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* The longitude of Bokhara has been ascertained approximatively by the itinerary of the route from Samarkand to Bokhara.

XVI.—*On the Gold-fields of Uruguay, South America.*

By H. Bankart.

My attention having been drawn, in the middle of the year 1867, to some remarks made by the Jesuits in their writings upon South America, in which they reported the existence of gold, south of Brazil, in the territory now known as the Banda Oriental, I determined to judge for myself and carefully examine the northern portion of the Republic. Starting from the highest revenue port (Salto) on the Uruguay, I took a nearly due east course, passing through the department of the same name for about 160 miles, without obtaining traces of anything but copper, lead, and iron. Portions of the district abound in magnificent agates and amethysts, with compact crystalline limestone, slate, and amygdaloidal rocks, intersected by petrified trees and animal fossils to a large extent. From thence I pursued my investigations in the neighbouring department of Tacuarembo, between the 30th and 33rd parallels of latitude, and 54th to 56th degrees of longitude, where I met with a complete change. Granitic and quartzose rocks of the primary formation, intersected by slate-reefs in immense ranges, met the eye on all sides, running into Brazil; most of them bearing in a northerly direction, and dipping to the east. In this, as in the adjoining state, wood of a stunted growth is only to be met with on the banks of the rivers. On examining the sands and detritus at the bottom of the rivers Tacuarembo Grande and Chico, I found a little very fine gold; and proceeding farther on the other side, I came upon some alluvial deposits washed down from the surrounding hills, consisting of gravel, rounded quartz boulders, decomposed slate, sometimes 30 feet deep, resting upon syenitic granite; this would, in many places, yield well with proper appliances. And at a place called Corralles, originally (from appearances) a lake, having all around limestone, auriferous quartz, and slate-reefs, I learnt that small petitas or pieces of the precious metal are constantly met with clinging to the roots of the palm-grass used for thatching purposes: no trial has as yet been made as to the probable deposit of gold below, for it is always a swamp. I learnt that some years ago a Brazilian, with the aid of his slave, had washed out over 50 pounds' weight of free gold, after three months' labour from a dry creek not very far from this.

I immediately proceeded to the spot indicated, and there saw the remains of their workings through the drift. On searching the neighbouring hills, I found several fine quartz-lodes bearing N.N.W. and dipping eastwards. I met with free gold here and there plainly visible to the naked eye, from which I took many samples, also occasionally auriferous pyrites below the surface; these lodes vary from 3 feet to 15 in width. A piece of solid gold weighing over 1 lb. (of 16 ounces) has been taken out of the quartz on the surface, and is in the hands of the Uruguayan minister of war.

Here I entered an open cutting about 6 feet deep, and descended into a shallow well cut into the quartz, and was able to pick down rock which contained gold of a superior quality. Between these gullies and the quartzose hills lay several flats, composed to some depth of gravel, rounded quartz and slate. Evidently having a probability of proving richer in metal than the adjoining creeks, which appear to be of more recent formation; but in all the gravel of the deep ravine which had been torn open by floods, I noticed an entire absence of small pieces of quartz such as are found covering the slopes of the mountains or in the lower deposits of gravel: these quartz-lodes are generally traversed by slate-reefs, and sometimes run into or cease when brought into contact with granite. To my surprise, I noticed here and there shepherds, even in these remote parts (who had never heard of other gold-fields), squatting on the ground, engaged in turning up the surface for about 15 inches, and breaking up the pieces of quartz with a hammer upon a stone mortar, setting aside such as contained visible gold, and rejecting the rest. By thus working for a few hours they managed to collect a small heap of specimens, which they carried home, and, after accumulating day by day a sufficient quantity, they calcined and pounded them in a *batea* with mercury. By this operation they obtained only the heavier gold, throwing away the rest as useless; the result gave them on an average, as far as I could judge, half an ounce per working day. The gold thus extracted finds its way sometimes into Montevideo, but more generally to the Rio Grande, where it is no uncommon thing to meet with purchasers of one to two hundred ounces at a time. The gold is of four qualities, ranging from 15 to 23 carats. The ground here answers to the surface-diggings of Australia and the placers of California, only the order of things is slightly reversed. In those countries the gravel was invariably washed to obtain the free gold, the quartz being thrown away; whilst in the Uruguay the quartz is alone crushed, and the gravel disregarded. No doubt some of the richest deposits lay in these accumulations, for wherever I washed this drift I invariably found gold, though in company with a large proportion of magnetic iron, which renders the separation of the gold very difficult. My investigations led me to enquire if there had been no excavations made in the quartz-reefs; and, in reply, I was shown various spots where shafts had been commenced but relinquished after going two or three fathoms deep, on account of water; which they greatly lamented, as in all cases the rock had proved extremely rich, but they had no appliances whereby they could get rid of this water. I devoted some weeks in testing the accuracy of their statements, and I was enabled to return with a plentiful supply of very good stone. I pursued my researches for about 90 miles in length on the course of the lodes, and stretching 18 miles across them. Several lofty hills of magnetic iron were encountered bounded by trap, and running into slate. And both in the gossau and in the gravel at their base, I washed more or less gold in every pan. In this department there are two extinct craters, one having been in active operation within the memory of several residents there. After satisfying myself that this country promised great results from the beneficial employment of capital, I returned to Montevideo, and communicated with the President of the Republic—laying before him the result of my labours. Up to this period the idea that gold to any extent existed in this province was ridiculed; but he at once promised his co-operation in the formation of a company, believing rightly that payable gold-fields offered peculiar attraction for increased immigration. Unfortunately his assassination followed shortly after, which deterred the realization of our hopes, until the present administration took office, who not only carried out all that General Flores had promised, but were prepared to go further (if called upon to do so). The company was speedily formed, and I was deputed to England to select and purchase the necessary buildings and machinery of the most recent and approved principle for carrying out their views.

The various assays made in England of the specimens I brought over gave the following results:—

No.		ounces.	dwts.	grains.
1	Gold	87	16	16
2	Fine Gold	76	0	0
3	Fine Gold	81	16	14
	Fine Silver	18	8	14
4	Fine Gold	2992	11	0
5	Fine Gold	6512	18	0

But it must not be for one moment supposed that because these samples have proved so rich, that therefore the whole of the lodes will be equally good; far from it. But I am of opinion that, with effective machinery and economical working, there presents in the surface and shallow sinkings, if not in the quartz-lodes, a very fair and remunerative field both for capitalists and labourers. I think from the reefs we may fairly average the produce at 2 ounces, if not more, to the ton, and that is far higher than the general result on other gold-fields; and I may say that the prospects, so far as I have tried, are considerably better than any I have seen (in an experience of over 17 years) amongst the principal gold-fields of the world. The climate is extremely salubrious, and the new mining law recently passed is nearly all that can be desired. Every article of foreign production necessary for or connected with mining operations is permitted to enter the country free of duty, and mines are excepted from all taxes for 20 years. A royalty of 5 per cent. is claimed by the Government on all gold or other minerals exported. Any person so disposed may enter upon any portion of the Republic they like, and search for minerals or gold, being required only to give a fair compensation to the owner of the land for any damage actually sustained by the miners' work. Whilst staying in the capital, I was sent upon two exploring expeditions after coal; but though the formations of the country around appear to be against such a probability, I discovered good graphite and jet, also hematite iron-ore to the westward of Montevideo, and to the east fine-grained marbles, white, flesh-coloured, and green; and rock rich in galena! Also large and strong lodes of pyrites and sulphide of copper associated with gold, evidently from the quartz and slate reefs that traverse them. These metalliferous lodes extend for many miles, giving unmistakeable evidences at the surface of the riches hidden below. Here ancient workings have been abandoned evidently from excess of water, which is abundant, and from paucity of capital. These are situated only about 90 miles from the seaport of Maldonado, and would, I feel sure, yield large results if properly and vigorously prosecuted.

XVII.—*Notes on the Map of the Peninsula of Sinai.*[*] By the Rev. F. W. HOLLAND.

THE Map of the Peninsula of Sinai does not profess to be more than a sketch-map, illustrating the general features of the southern portion of that interesting country. In the winter of 1867-8, it was my intention to have spent some months in thoroughly exploring and mapping that portion of the Peninsula which lies between Suez and Jebel Musa, west and south of the mountain ranges of Jebel er Rahah, and Jebel et Tîh, and for this purpose I received a grant of instruments from the Royal

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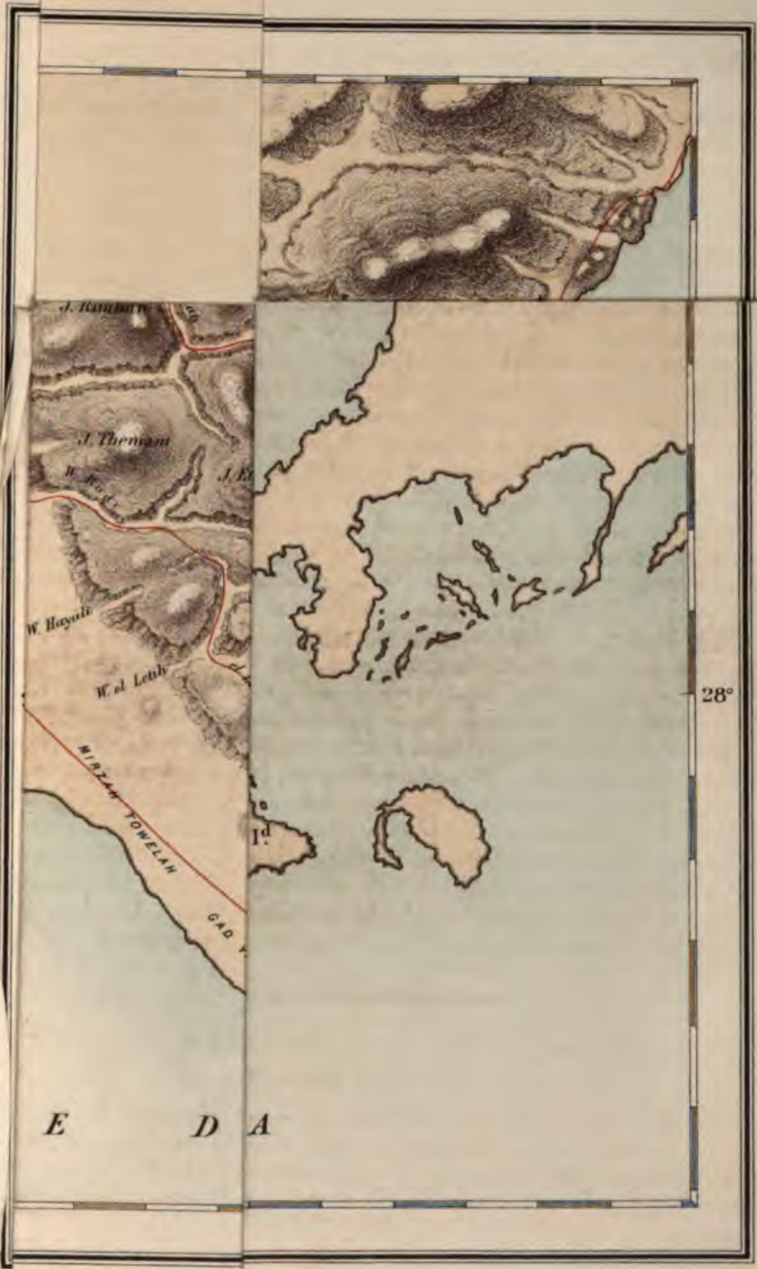
[*] In illustration of Mr. Holland's Memoir in the 'Journal,' vol. xxxviii., p. 237.



hical Society by J. Murray Albem

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Geographical Society. But, shortly before starting from England, I heard of the project of the Ordnance Survey of that same district, which was originated by the late Rev. Pierce Butler, and has since been brought to a successful issue by Captains Wilson and Palmer, of the Royal Engineers, under the directon of Sir Henry James.

It seemed useless for me to undertake a work, which was soon to be accomplished so far better by professional engineers; but knowing, from former experience, how exceedingly faulty the existing maps of the Peninsula were, both with regard to the delineation of its leading features and its nomenclature, I felt that I should be doing good service by making a general preliminary exploration of the country, tracing out its main wadys, which form the roads, fixing the positions of the most prominent mountains, and determining more accurately the Arabic names.

To effect this it was necessary to travel on foot, and to associate as much as possible with the Arabs; but there was little difficulty in doing this in a country where the inhabitants so gladly welcome all travellers. A short account of my wanderings will be found in the 'Journal' of last year. It only remains for me now to state as briefly as possible how the information contained in the map now presented was arrived at.

Starting from Suez, I kept down the coast as far as the hot springs of Jebel Hummâm. Thence retracing my steps I turned up Wady Ghurundel, and passing round the back of the Hummâm Range, descended again to the sea-coast by the Wady Taiyibeh. From this point, I kept along the plain of El Morkhah, until I reached the mouth of Wady Feiran, which I followed up to the Wady es Sheikh; and this wady led me to the convent of St. Catherine, at the foot of Jebel Musa.

Making this my head-quarters for some weeks, I traced up the principal wadys, and ascended all the highest mountain-peaks in the immediate neighbourhood, taking bearings with my azimuth compass, and sketching-in the surrounding country; when I had thus roughly mapped this district, I proceeded to take longer excursions accompanied by an Arab, whom I had selected as my companion on account of his intelligence and accurate knowledge of the country. By these excursions, on which I was generally absent some four or five days, I was enabled to explore a larger area; and I traversed the mountain ranges east and south of Jebel Musa, discovering the large plain of Senned, and ascending Jebel Umm Alawi, Jebel Abû Ma'sud, Jebel Umm Shaumer, and other mountains—from all of which I took sketches and bearings of the country around. My Arab and myself, laden with our blankets and guns, could not carry provisions for more than five days, so that, when I found it necessary to be absent for a longer time, I engaged another Arab with his camel to accompany us. Thus provided, I next proceeded to make longer excursions. First striking southwards, I crossed the Wady Rahabeh, and passing over between Jebel Fera and Jebel Turfa reached Jebel eth Thebt, which had never before been visited. From the summit of this mountain, I obtained an extensive view over the south-western portion of the Peninsula. I afterwards crossed over a somewhat difficult pass to the north of Jebel Humr, and bearing eastward followed down Wady Ethmed till it was joined by Wady Kyd, one of the most fertile wadys in this region. I then struck northwards again up Wady Kyd, and crossing the Fera el Adhal, a remarkable basin enclosed by rounded mountains, I passed to the east of Jebel Fersh Sheikh el Arab, and so returned to the convent. After a few days' rest I again set out to explore the south-eastern portion of the Peninsula. I followed down Wady Nush to the sea coast at Dahab, with the intention of keeping along the coast from this point to Sherm; but the weather being stormy I found it impossible to pass under Jebel el Araby, the only path, which is said to be an ancient paved road, being rendered dangerous by the waves. I therefore turned inland again, and passing at the back of this mountain range found an easy road across the heads of several wadys, which led me by Wady Melhadge to its junction with Wady Kyd and Wady Ethmed, south of which it takes the name of Wady Ab Orta. Here I stopped to ascend Jebel Umm Zayrey, which appeared to be the most prominent mountain in this neighbourhood, and from the summit of which I was enabled to sketch in with tolerable accuracy the position of the surrounding mountains and wadys. Following down Wady Ab Orta to the coast, I continued my course southwards until I reached Wady Khushab, obtaining water on my way from the wells of Sherm. Here again I made a short stay to visit Ras Mohammed, and on starting northwards I followed the upper road to Jebel Sahara, and from the summit of this mountain again traced out the course of the neighbouring wadys, and obtained bearings, which connected my work with my sketches from Jebel eth Thebt and Jebel Sahara. I continued to follow the upper road until I reached Wady Budr, which led me down to the plain of El Kaa, crossing which I arrived at the village of Tor; the route, which is marked in the map as running down the plain of El Kaa, near the coast, and also the inland route between Sherm and Wady Kyd, I had twice traversed during former visits to the Peninsula.

While staying at Tor I visited Jebel Nakkûs, and Jebel Mokatteb; I then crossed El Kaa, and ascending Wady Hebran and Wady Solaf, returned to Jebel Musa. I afterwards made an excursion to Jebel Serbal, and ascended by Wady er Rymm the southern peak, and passed round the western side of the mountain, visiting on my way the secluded valley of Sigillye with its ruined monasteries.

On my return to the convent, I determined to explore next the north-eastern district. Skirting the northern side of the Plain of Senned, I followed down Wady Zuthera to the north of Jebel Habshi, and, crossing the easy passes of Klyif and Bayu, reached the sandstone district of Wady Maytoura. On arriving at Wady Kenneh I bore westwards to the curious rocks of Hudeibat el Hejaj, called by Dr. Stanley, "Herûnet Haggay." I had previously journeyed down Wady Zal to this point, and was anxious to visit Ain Huthera, which has been identified with the Hazeroth of the Bible. From this point, following down Wady Ghuzâleh, I arrived at Wady el Aïn es Suffla. Here I again turned northwards, and traced up this latter wady till the road led me across a curious pass to Wady Zelleger, at the bottom of which are situated the springs of Wady el Ain el Alya, the upper Wady el Ain. The existence of an upper and lower Wady el Ain has not before, I believe, been noted. Continuing westwards up Wady Zelleger I reached the elevated and fertile plateau of Zenanîk, and visited the wells and ruins of Ain el Akhdar. Thence I proceeded northwards past Jebel Shayger, and up Wady Sîk to the Nukb Mureikhy, and, after ascending the various peaks of Jebel Odjuech, I returned to the convent.

I afterwards paid a visit to Serâbit el Khadim, taking the usual road by Wady Berah and Wady Burk. After spending some days in exploring the mines and inscriptions at Serâbit el Khadim and Wady Nukb, I followed down Wady Baba, and so reached Wady Mughârah and Wady Mokatteb, where I also spent some days.

On my final return to Suez I took the road which leads up Wady Sidri and Wady Mugraffe, from Wady Mokatteb to Serâbit el Khadim, and paid a visit to Jebel Sarbut-el-Gemel and Wady Humr.

These were my main routes, and they can easily be followed on the map by the red line which marks them. It has been impossible to mark the many smaller excursions which I have made, or to record in the map all the numerous names which I collected of the less important mountains and wadys. But this imperfect sketch of my routes will give some idea of the method in which the map has been made, and the amount of dependence that may be placed upon its accuracy. It is a record of what I saw and sketched on the spot. I always travelled with my compass, watch, and note-book, in my hand, sketching the country roughly in as I walked along, and correcting my calculations by dead reckoning, and, as often as I was able, by ascending some prominent mountain, and taking careful bearings to other well-known peaks. The sea-coast having been accurately surveyed, and the position of Jebel Musa determined, I was enabled to fix from these pretty accurately the position of other points.

Want of food and water sometimes compelled me to push on more rapidly than I should otherwise have done, especially during the latter part of my excursion to Ras Mohammed. The anxiety of having an empty water-skin, and the necessity of searching for water as I went along, somewhat confused my reckonings between Jebel Sahara and Wady Budr, but, on the whole, the map presents a faithful record of the main features of the Peninsula. It will be seen, on comparison, that it differs much from former maps, especially in the region south and east of Jebel Musa. The range of Jebel Umm Alawi, and the large plain of Senned, are new features, and the conventional straight mountainous ridge running down from Jebel Catherine to Ras Mohammed has disappeared.

The remarkable barrier of mountains extending eastwards across the Peninsula from the south of Jebel Serbal has also never before been so clearly defined. But the special point which I have endeavoured to illustrate has been the drainage of the country, which is very curious, and has not been accurately represented in any previous map.

This map, as I stated at the outset, does not profess to be more than a sketch; but, since making it, another visit to the Peninsula of Sinai, in connection with the Ordnance Survey Expedition, has enabled me, in many points, to test its accuracy, and I can state with confidence that it correctly represents the leading features and most remarkable characteristics of that country, which, from its historical interest and physical peculiarities, has, and will always continue to attract so much interest.

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